INDOOR PERMANENT EXHIBITS

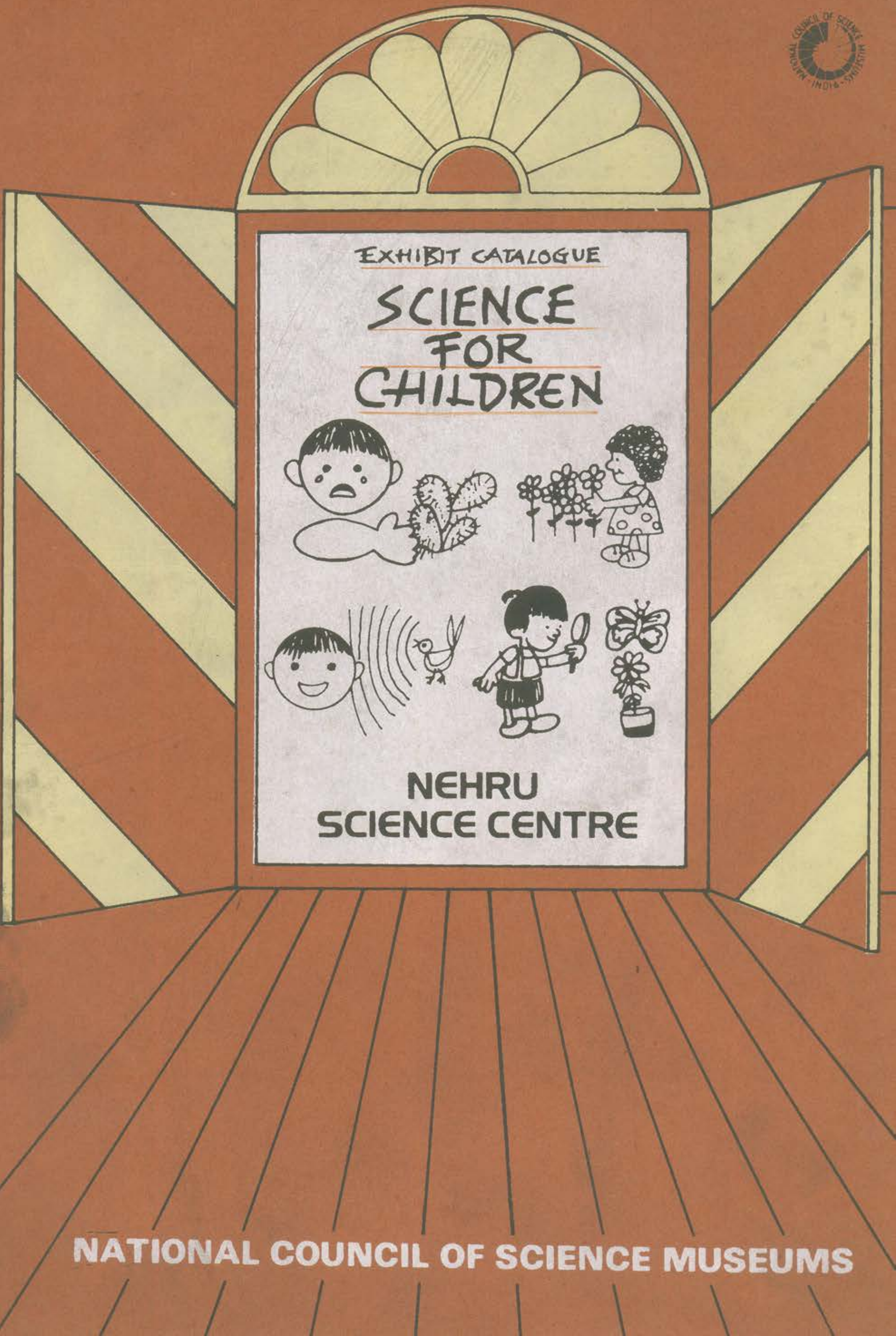


EXHIBIT CATALOGUE

SCIENCE FOR CHILDREN

NEHRU SCIENCE CENTRE

NATIONAL COUNCIL OF SCIENCE MUSEUMS

Permanent Indoor Exhibits

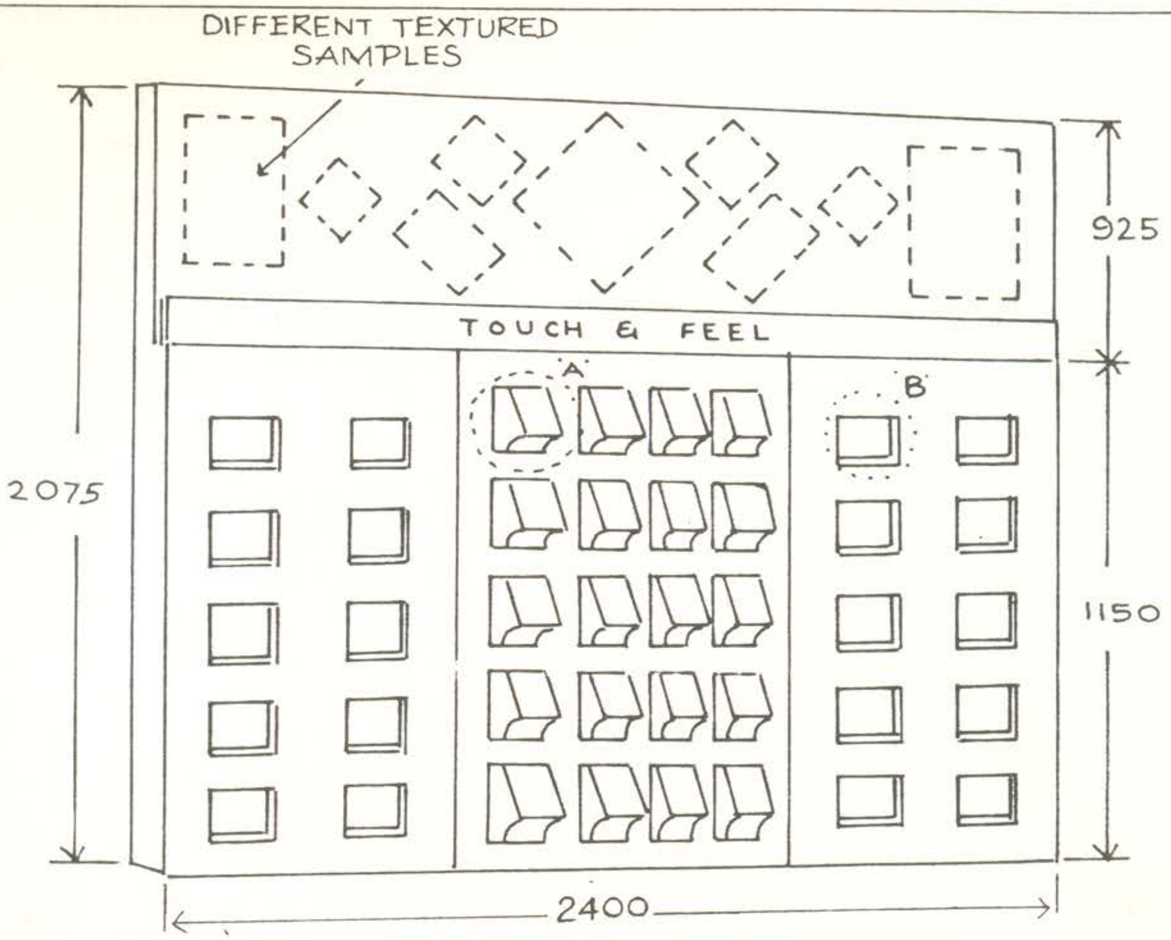
SCIENCE FOR CHILDREN

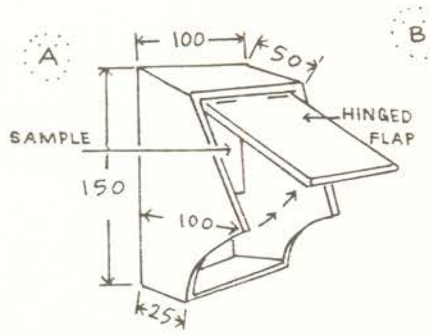
designed and developed
in 1984 – 85, at

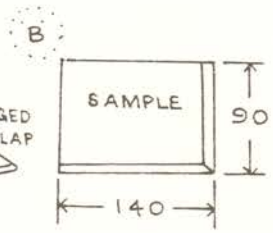
NEHRU SCIENCE CENTRE
BOMBAY

NATIONAL COUNCIL OF SCIENCE MUSEUMS
19A, GURUSADAY ROAD : CALCUTTA 700 019 : INDIA

FEBRUARY 1987







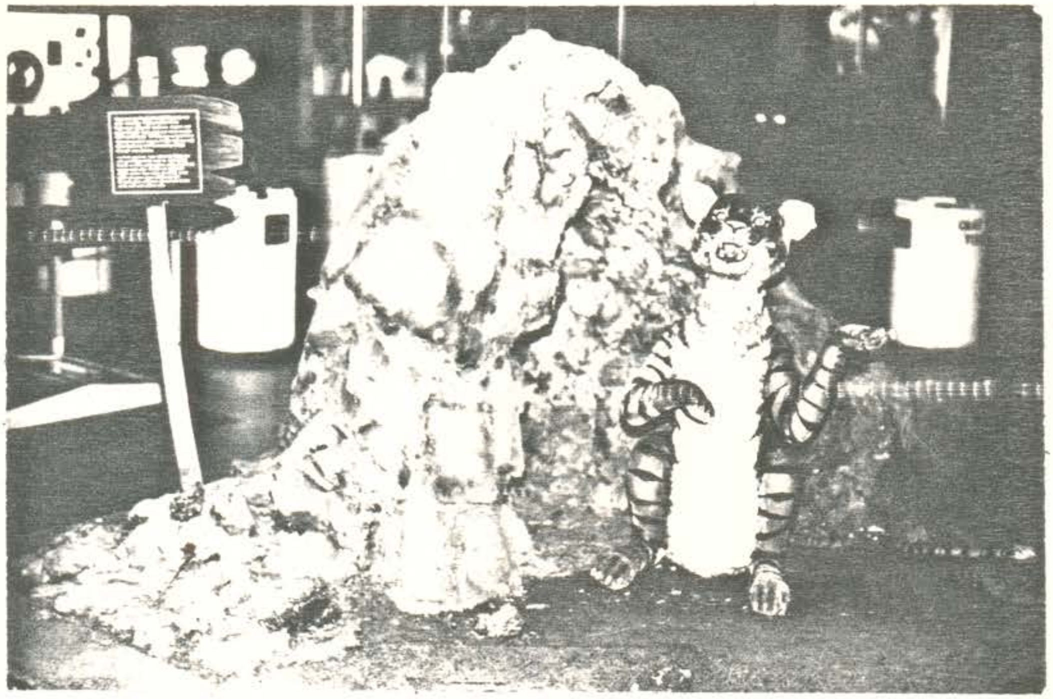
Touch all the surfaces of the rectangular frames with your fingers and get a feel. Now insert your hand inside each wooden pocket and from your earlier experience try to identify the surface inside. In case you are unable to identify it by touching, you can lift the flap of the pocket and see the surface. How accurate is your guess?

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

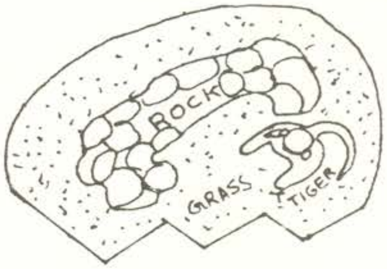
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
1	TOUCH	QUIZ

ALL DIMENSIONS IN M.M.



Welcome my young friends ! Observe my body carefully. Various parts of my body have different textures, shapes and colour shades. I can roar and some people say that I smell badly. All this you can perceive through sensory organs. In this hall you will enjoy exploring and discovering things through your senses.



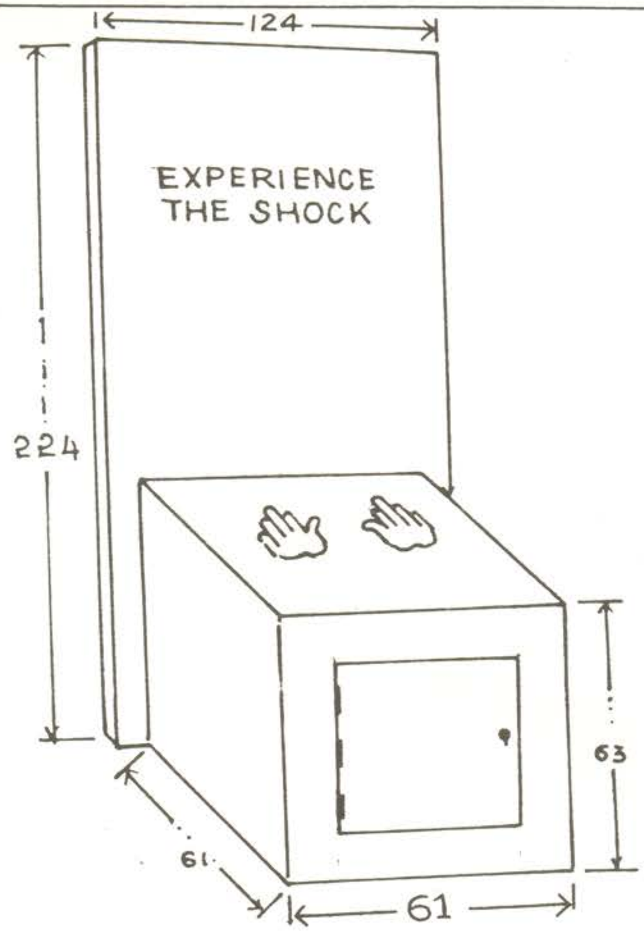
PLAN

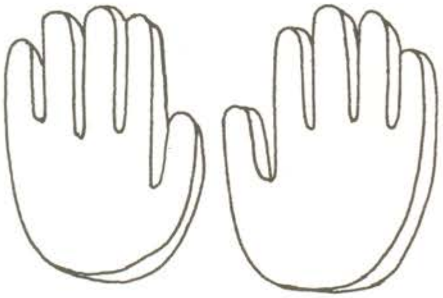
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

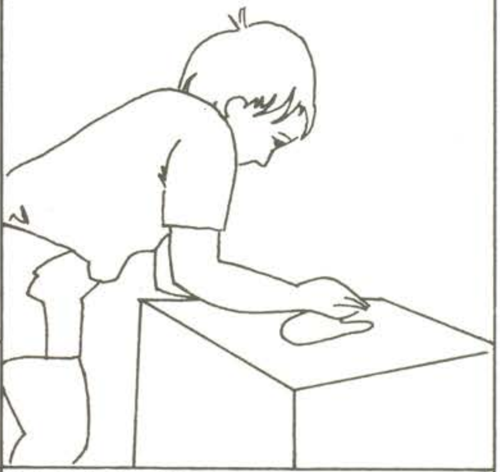
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
1 A	COMMON	TIGER

ALL DIMENSIONS IN C.M.







Place both your palms on the metallic palms provided here. What do you feel? A mild electric shock is experienced intermittently.

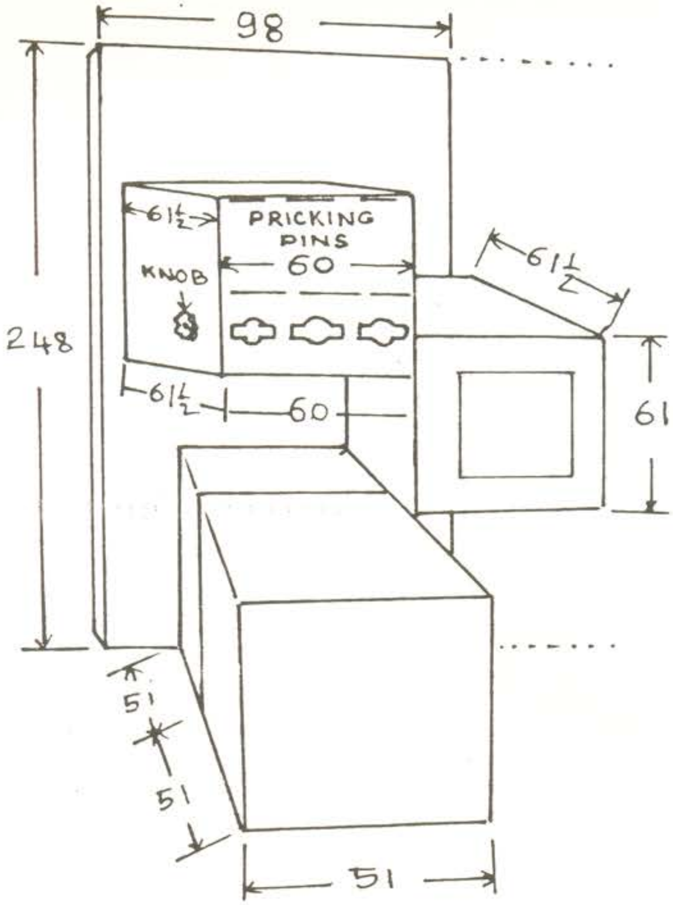
Now you are familiar with a kind of feeling rendered by an electric shock.

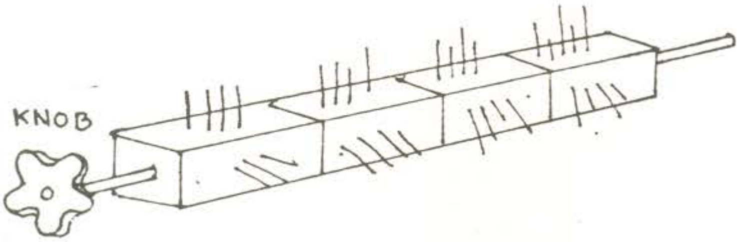
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
2	TOUCH	SHOCK

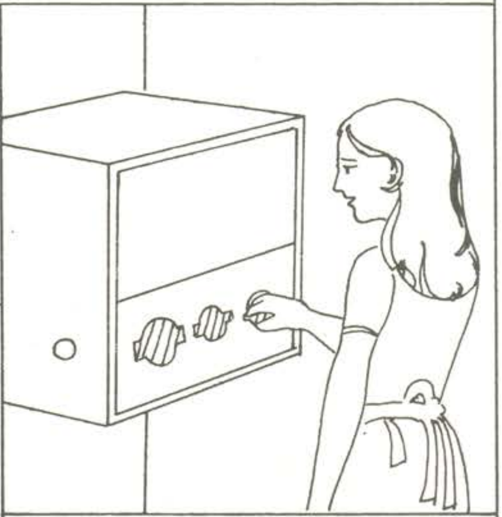
ALL DIMENSIONS IN M.M.





Insert your hands through the openings in the front cover and place your palms on the surface inside. Palmskin of your hands will experience some pricking points. Try to guess the number of pricking points without seeing it. To check your guess, push the front flap inside and see. Turn the knob on the left side of the exhibit and repeat the experiment with different combinations of pricking points.

[p .t.o.



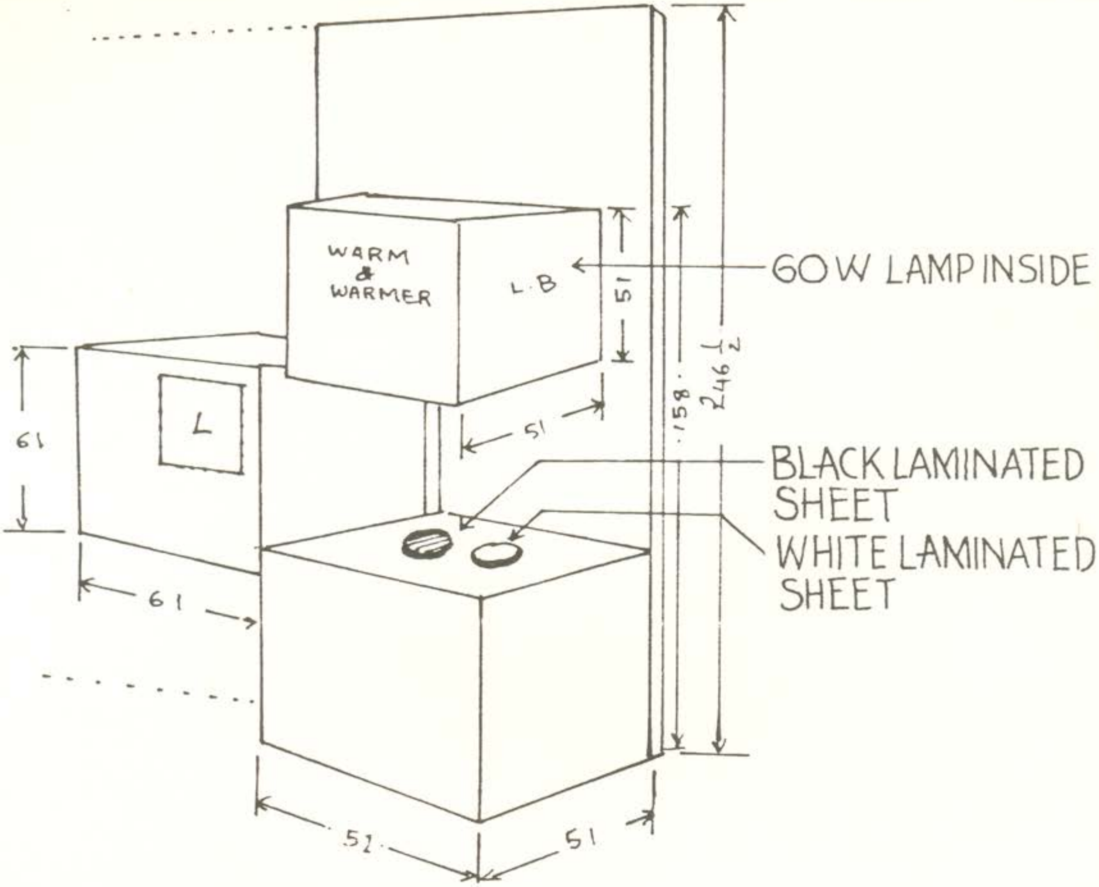
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

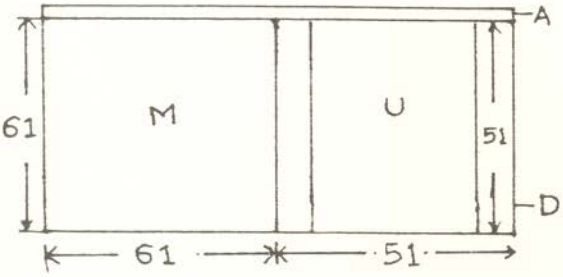
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
3	TOUCH	QUIZ

ALL DIMENSIONS IN C.M.

Your guess may not be correct sometimes if the pricking points are very close to each other. Your guess is likely to be worse if you place the reverse side of your palms on the pricking pins.



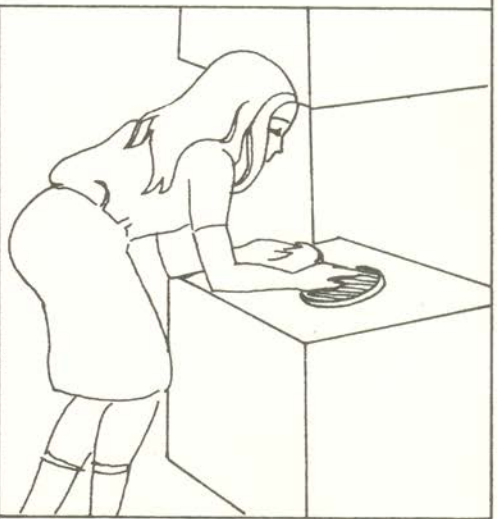


PLAN

A· BLACK BOARD
D· DOWN BOX
M· MIDDLE BOX
U· UPPER BOX
L· LABEL
L·B· LAMP BOX

Place both your hands on the illuminated discs here. What do you feel? which disc is warmer - the white or black? Can you guess the reason?

Black surface absorbs all the heat radiation from the electric lamp whereas the white surface reflects it back. Hence the black disc is warmer than the white.

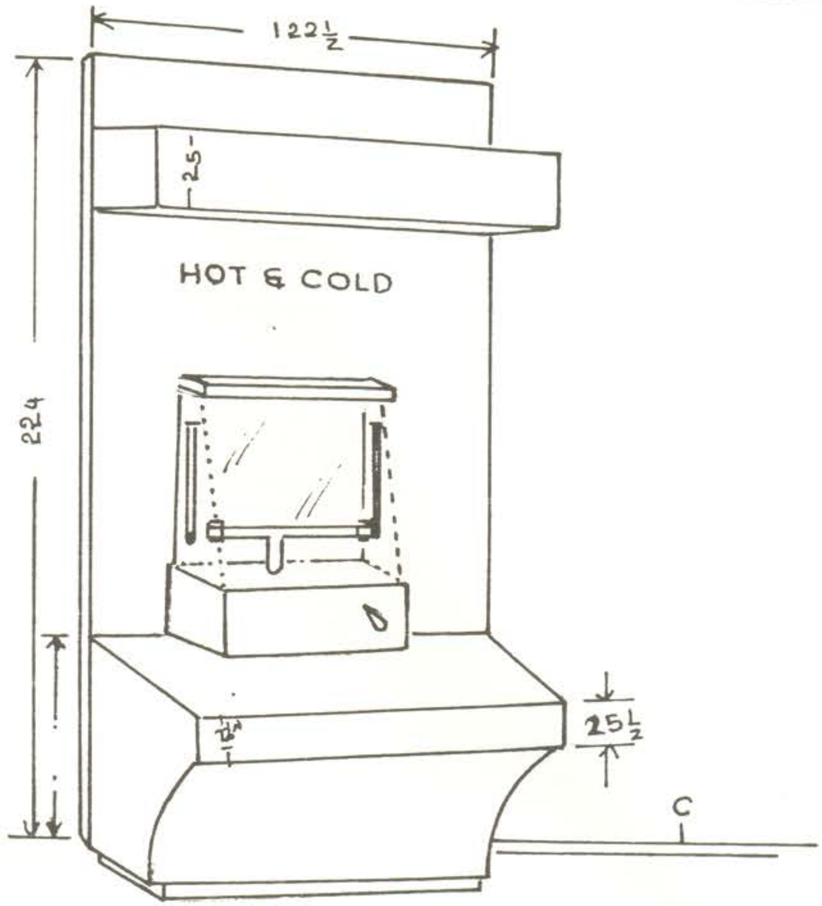


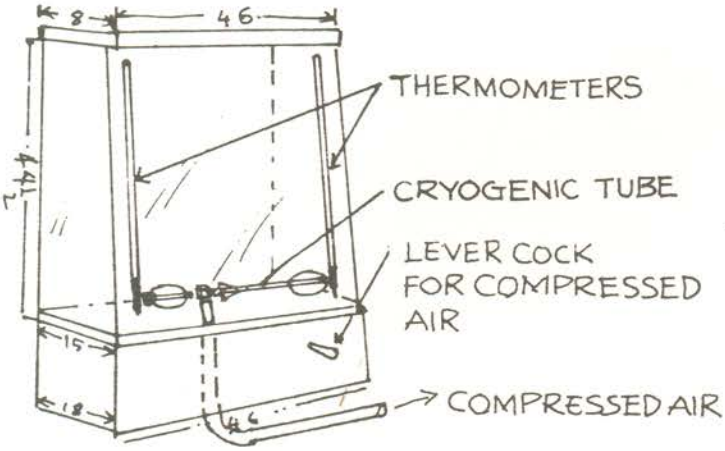
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

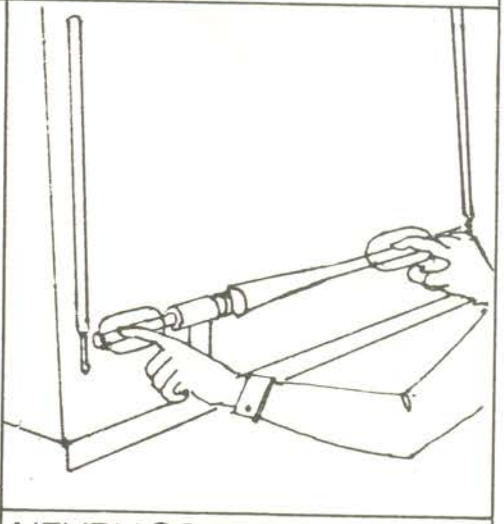
SL.NO	SECTION	TITLE
4	TOUCH	HOT & COLD

ALL DIMENSIONS IN C.M.





The compressed air enters the middle of the tube where it spins at a very high speed and moves towards the hot outlet making the tube surface hot, whereas a portion of the air expands and comes out of the cold outlet. Here air temperature drops and makes the tube surface cold.

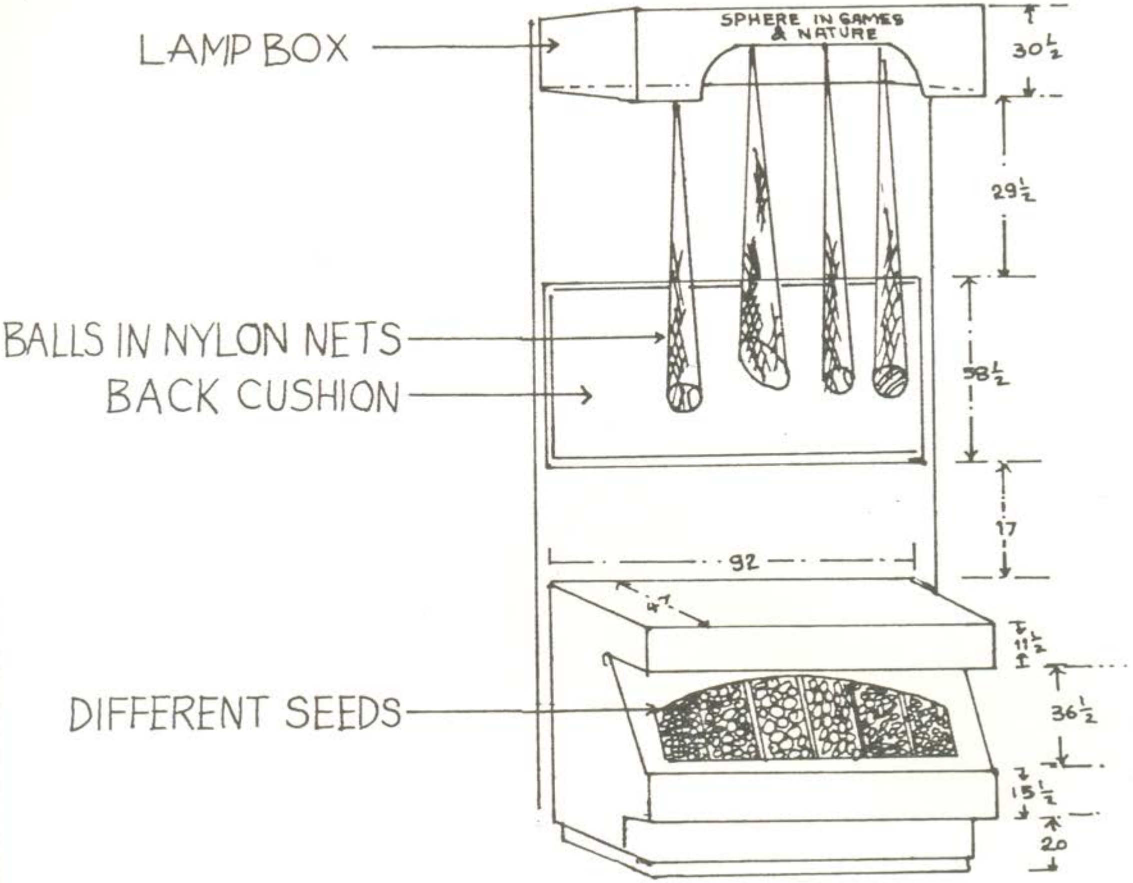


NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
5	FEEL	TOUCH

ALL DIMENSIONS IN C.M.



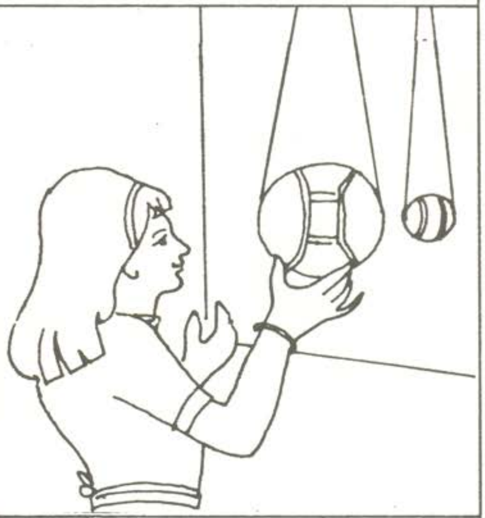
CRICKET BALL

FOOT BALL

SOCCER BALL

SHOT PUT BALL

You might have played with many balls. Can you identify which ball is used for which game? Observe all the balls carefully and note their sizes and shapes. A perfectly round ball is called a sphere. Note the peculiar shape of a rugby ball. It is an ellipsoid. The surface of the football displayed here shows two shapes. The yellow shapes have six sides called hexagons whereas the black shapes have five sides called pentagons. Push the balls to the back wall. [p .t.o.



NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

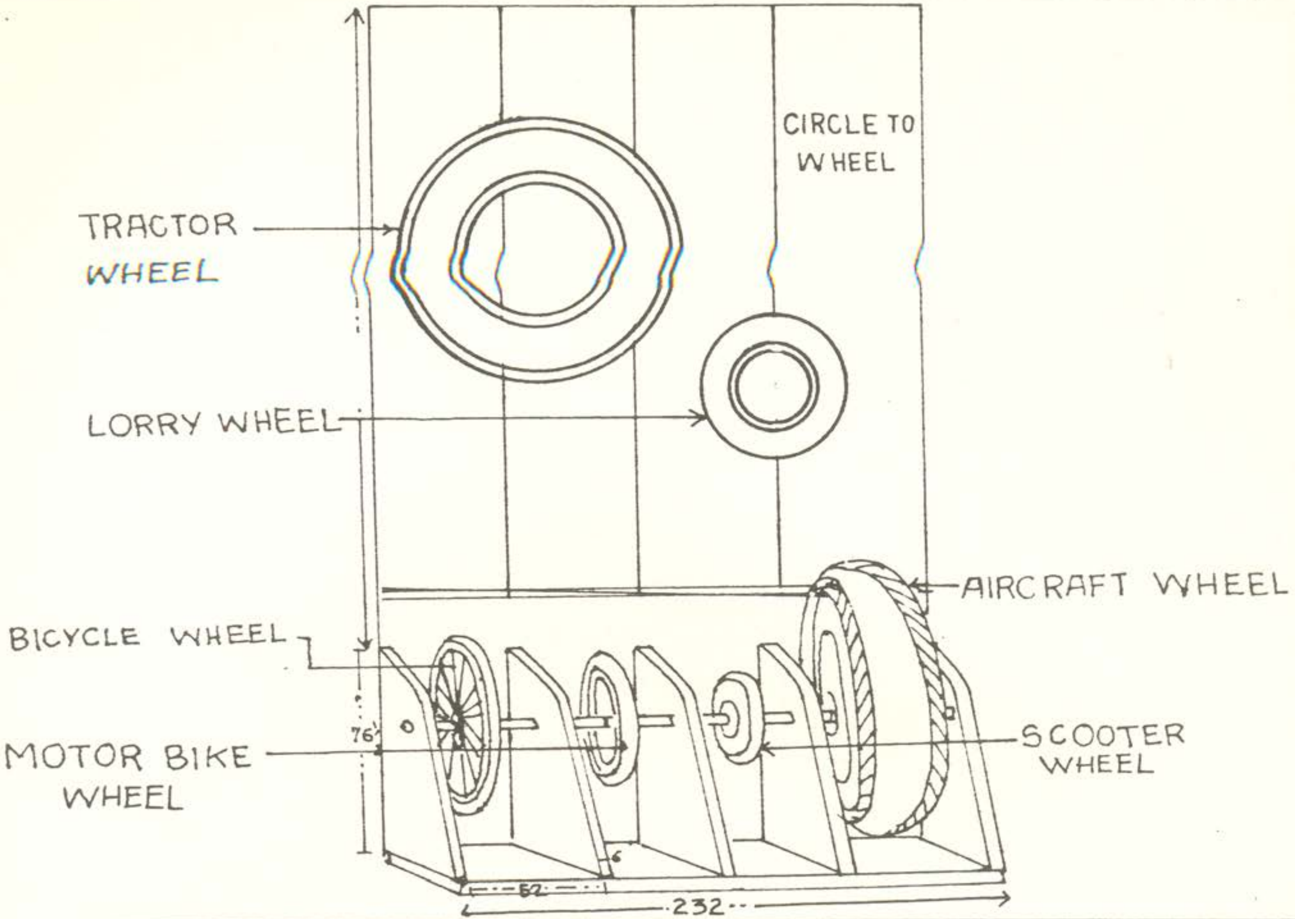
SCIENCE FOR CHILDREN

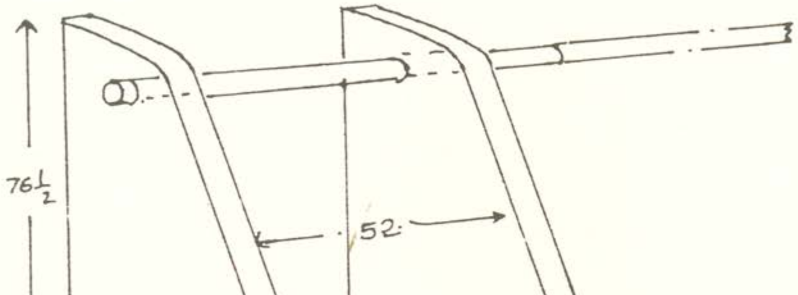
SL.NO	SECTION	TITLE
6	SHAPE	SPHERE

ALL DIMENSIONS IN C.M.

They will bounce of. Different balls bounce in different manners. Try to find out the reasons.

Nature is very efficient in producing circular or spherical shapes in seeds, fruits, flowers etc. Some of the seeds are displayed here.





Man learnt from experience that circular objects can roll and move faster. The circle became an important element in the growth and development of society. Can you identify these wheels?

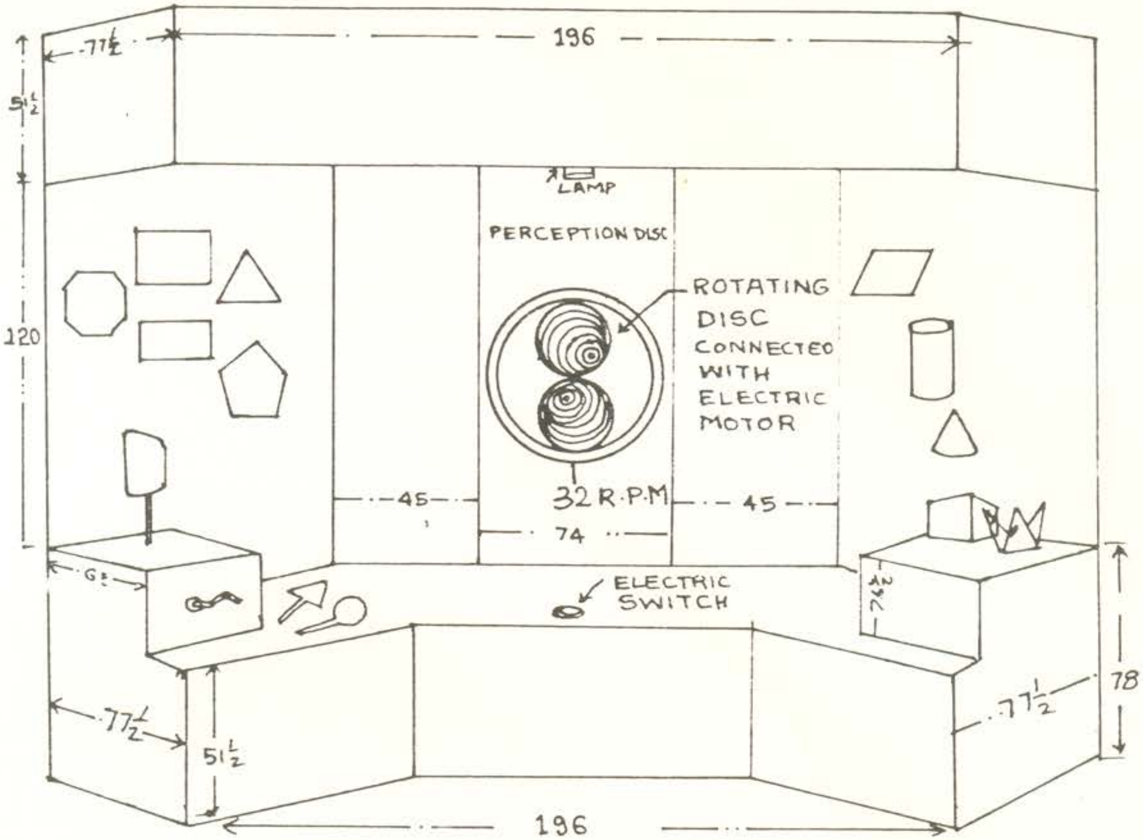
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

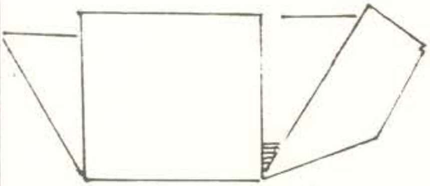
SCIENCE FOR CHILDREN

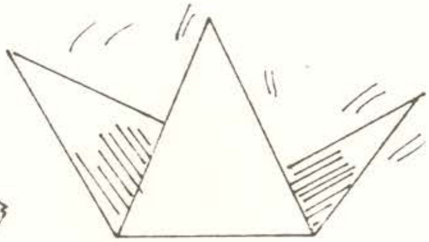
SL.NO	SECTION	TITLE
7	SHAPE	CIRCLE

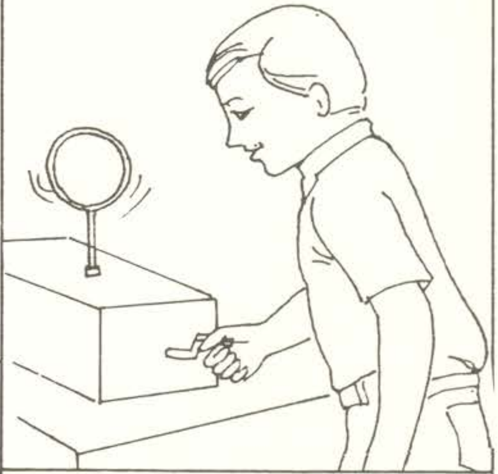
ALL DIMENSIONS IN C.M.

two glass plates. The soap bubbles form and rise up in the cylinder and in the cavity. Look at the shapes of the bubbles in the cavity, the shapes looks like that of a beehive. Try to make various shapes by adjusting the flow of air.









Varied shapes of solids can be made with plates of different geometric shapes.

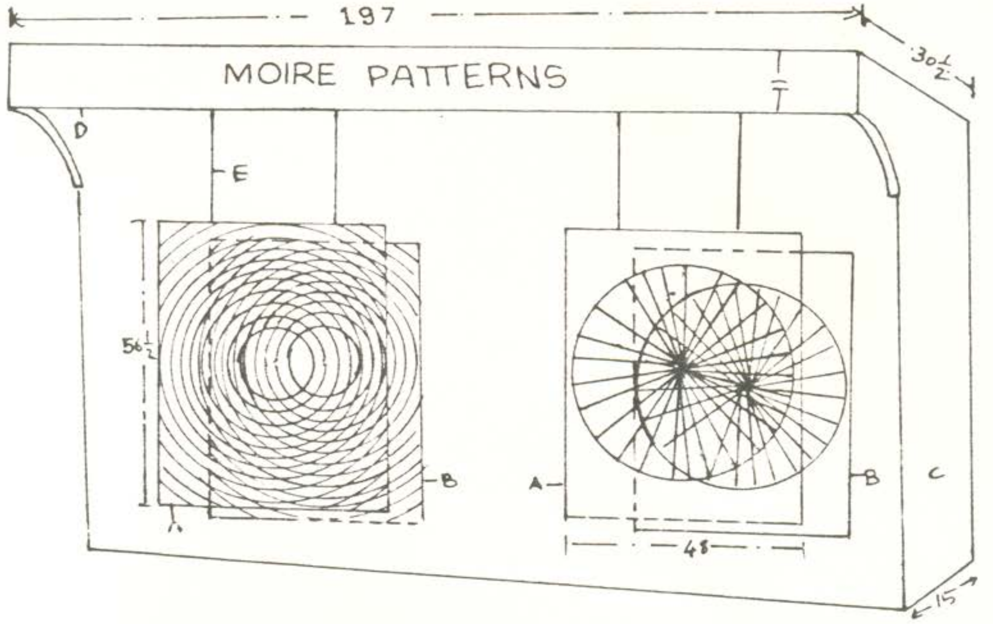
Fold the triangular plates placed on the table to get a pyramid. Try to get a cube by folding the square plates. Similarly, pentagonal plates will form pentagonal dodecahedron on folding.

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

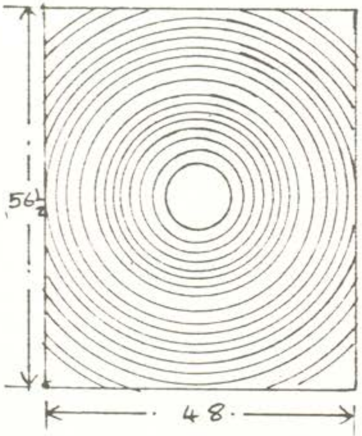
SCIENCE FOR CHILDREN

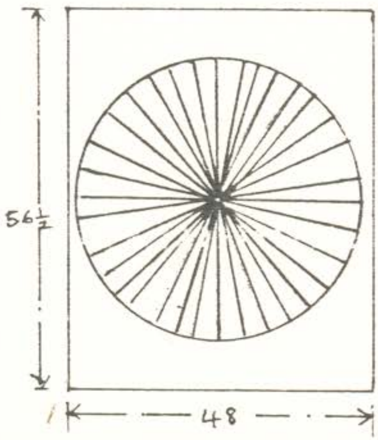
SL.NO	SECTION	TITLE
9	VISION	PERCEPTION

ALL DIMENSIONS IN C.M.



A·A· PATTERN ON FILM
B·B· PATTERN OF THE SAME ON TRANSPERENT GLASS
C· BACK BODY
D· TOP FRAME
E· CHAIN





Look at the patterns from different distances and angles. Swing the front plate a little and observe the patterns from a distance. The patterns thus formed are known as Moire Patterns. (Moire is a French word for watered) Moire Pattern arises by overlapping of figures with repetitive feature. [p.t.o.

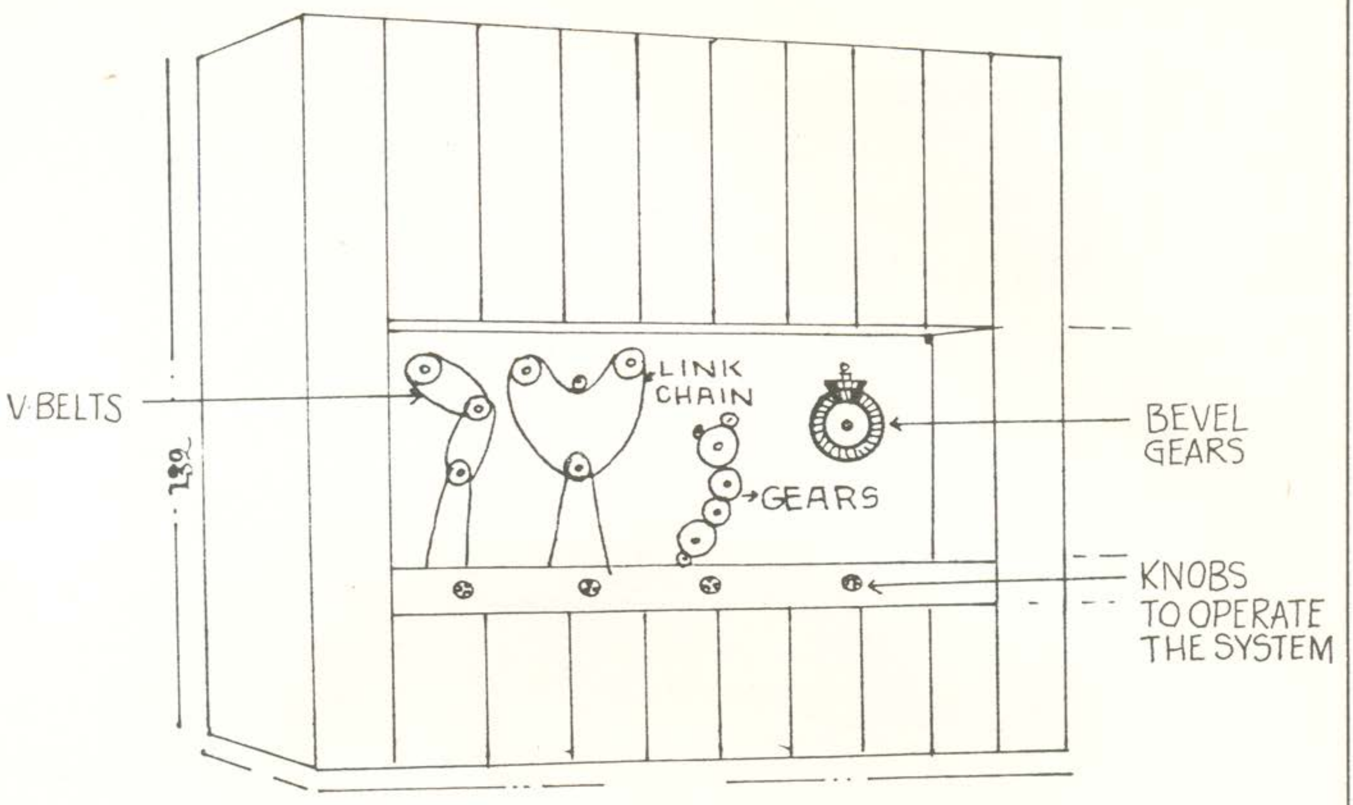
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

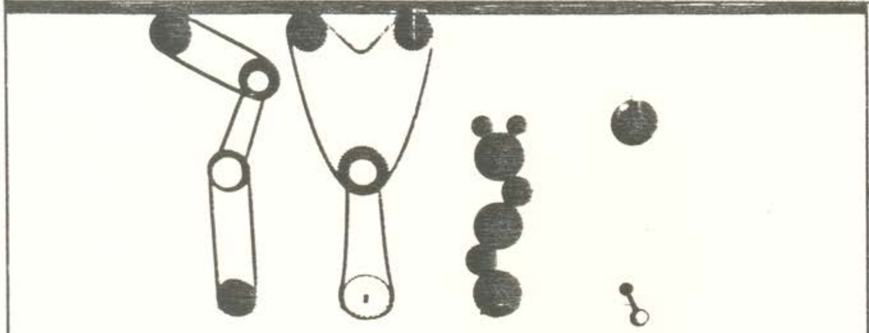
SCIENCE FOR CHILDREN

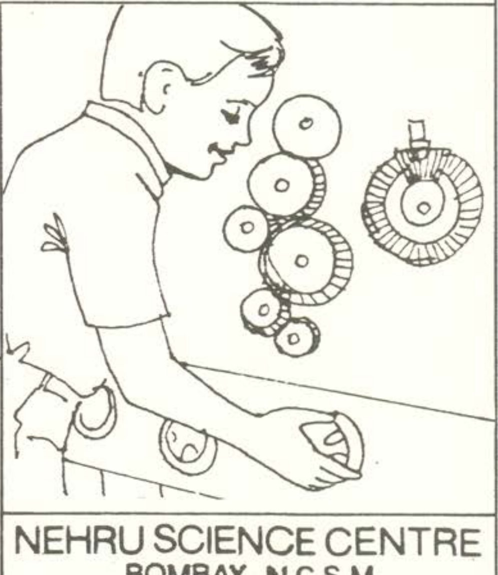
SL.NO	SECTION	TITLE
10	2D	MOIRE PATTERN

ALL DIMENSIONS IN C.M.

Moire technique has many application in science and shows many peculiarities of human vision.







Circular shape plays an important role in our life. All machines have certain parts which are circular in shape, such as pullies, gears, wheels, rods etc. Some of the mechanisms used in machines are displayed here.

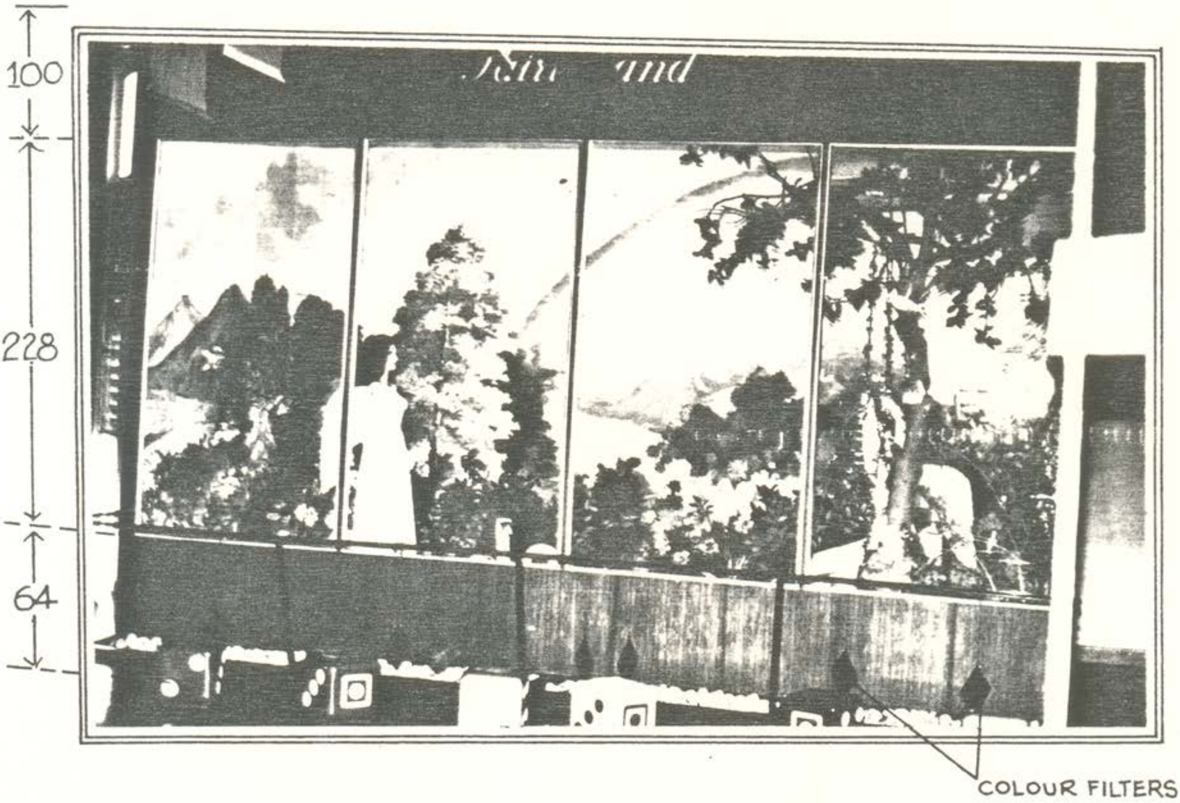
Turn the crankwheels at the bottom and observe the different movements. These mechanisms are used to transfer mechanical power from one place to another. Observe the directions of rotation of different parts of the mechanisms.

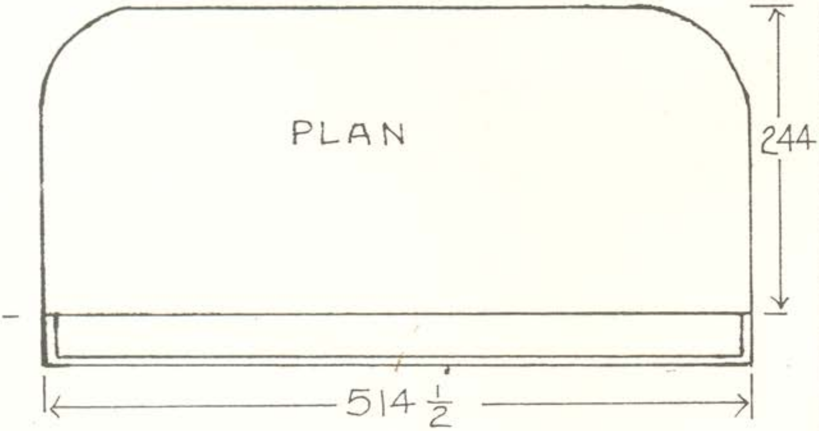
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

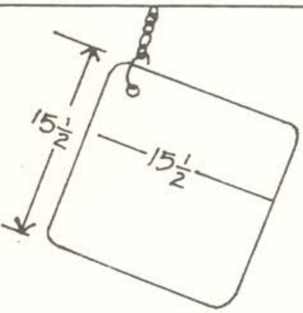
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
11	SHAPE	WHEELS

ALL DIMENSIONS IN C.M.







COLOUR FILTERS

RED
YELLOW
BLUE
GREEN

A· DIORAMA B· HANDLE FOR SLIDES.

Fairy Land

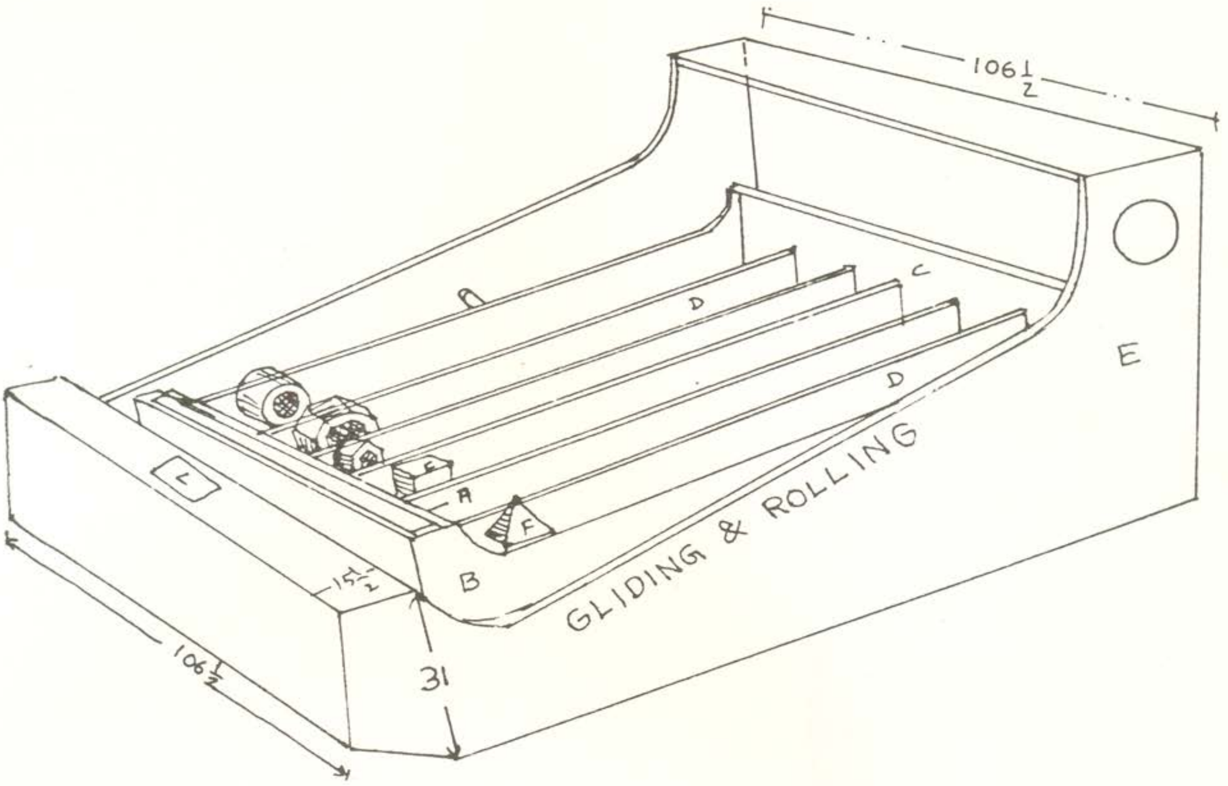
(THROUGH COLOUR FILTERS)

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
12	COLOUR	FAIRY LAND

ALL DIMENSIONS IN C.M.



With the number of sides increasing, a triangle gradually becomes a circle and a pyramid tends to become a sphere. A flat two-dimensional figure with many sides is called a polygon and a three-dimensional solid with many faces is called a polyhedron.

With the increasing number of sides, a polyhedron becomes smoother and smoother so that it can roll easily.

Tilt the board and observe that the sphere rolls first, then octahedron and then hexahedron. Polyhedrons having smaller number of sides like pyramid, cube etc., do not roll but slide down when the board is tilted further.

TOTAL GLIDING ROLLS EIGHT.

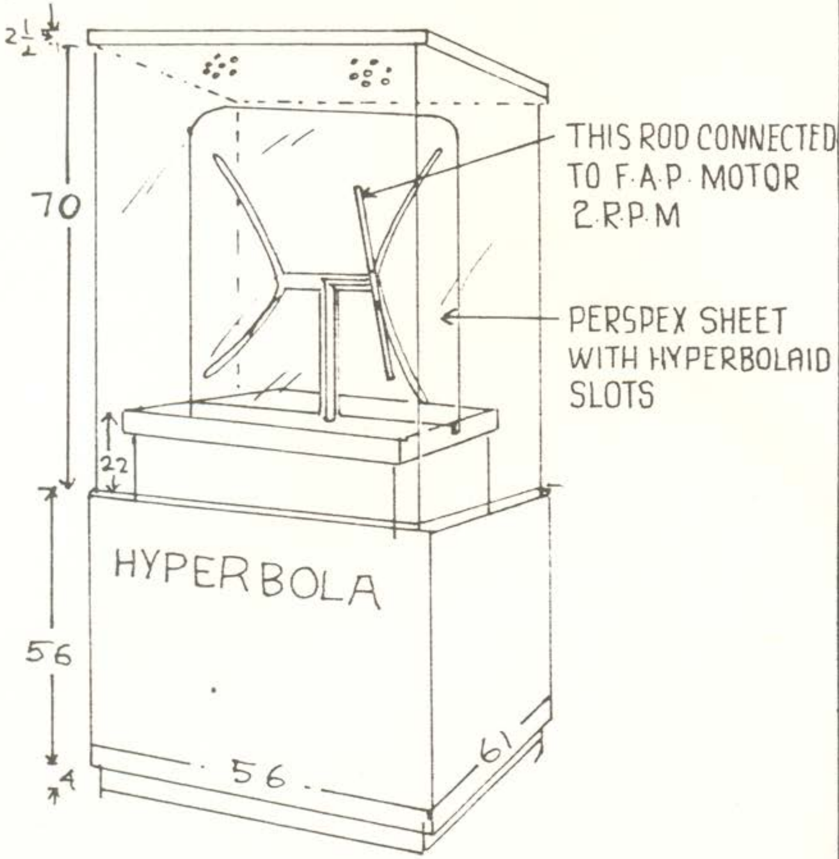
A. HANDLE FOR LIFTING
B. BOX WITH SLIDING WAY
C. BOX END WITH CUSHION
D. RACKS FOR GLIDES
E. HOLDING BODY

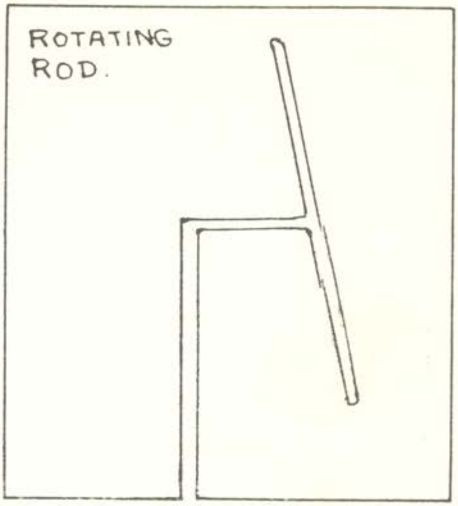
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

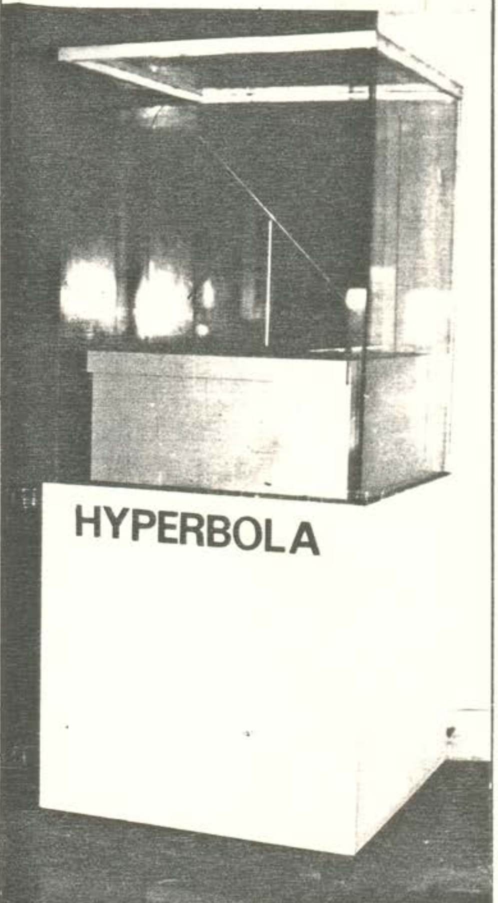
SCIENCE FOR CHILDREN

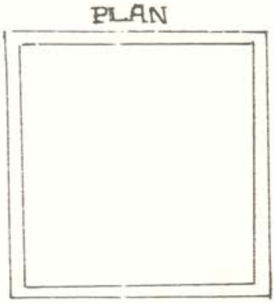
SL.NO	SECTION	TITLE
13	SHAPE	GLIDING & ROLLING

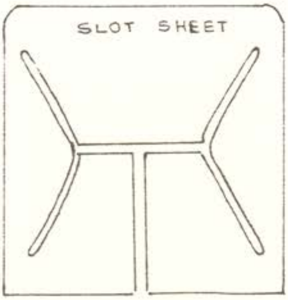
ALL DIMENSIONS IN C.M.


2½
70
THIS ROD CONNECTED TO F.A.P. MOTOR 2 R.P.M
PERSPEX SHEET WITH HYPERBOLAID SLOTS
22
HYPERBOLA
56
56
61
4









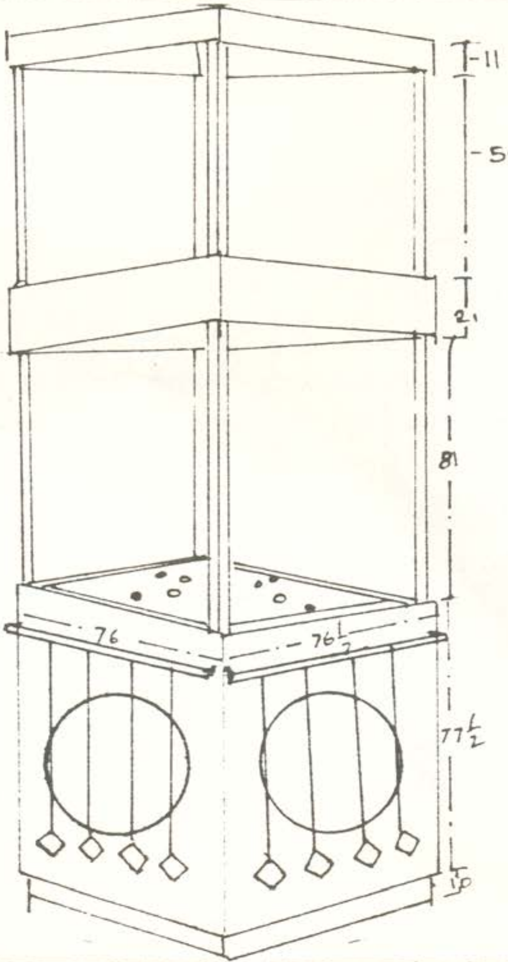
Is it possible for a straight stick to pass through a curved path? A straight stick, in this exhibit, is smoothly passing through a curved slit, the shape of which is called a hyperbola. The straight metal wire, while revolving around, forms a surface of revolution, which is hyperbolaid like in a cane seat. Observe that a hyperbolaid cane seat is made out of straight sticks.

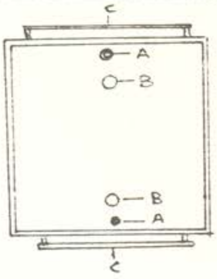
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
14	SHAPE	HYPERBOLA

ALL DIMENSIONS IN C.M.





A. START SWITCHES
B. SLOTS FOR LIGHTS TO FALL ON THE TOP
C. HANDLE

PLAN

Push any switch to start the game. Two circular holes near the push switch allow the light beams to project on the white screen at the ceiling of the exhibit.

Turn the edge of the aluminium disc on your left to bring any particular reference colour on the screen. Now choose the correct filter or a combination of filters and place it on the right hole so that the colour of the light falling on the ceiling

[p.t.o.

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

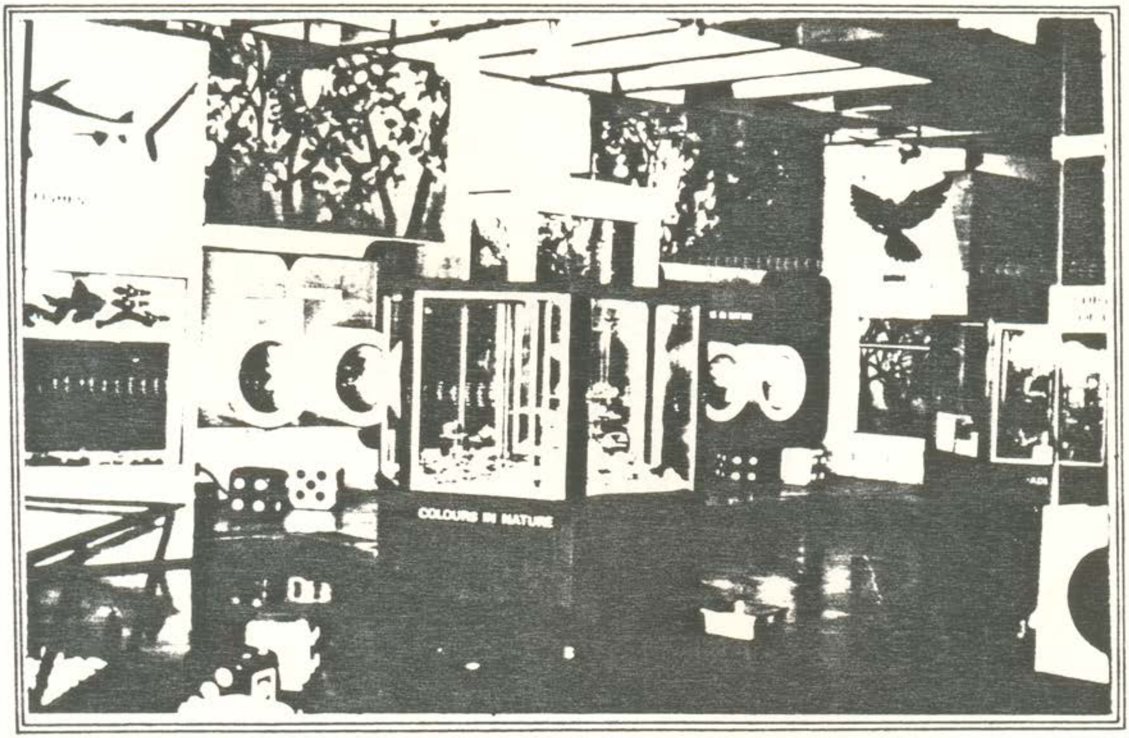
SL.NO	SECTION	TITLE
15	COLOUR	COLOUR FILTERS

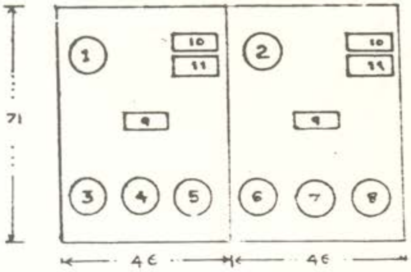
ALL DIMENSIONS IN C.M.

exactly matches the reference colour coming through the left hole.

Turn the edge of the aluminium disc on your left again to set another reference colour and try a different combination of filters on the right hole to match the reference colour.

Repeat the experiment.





1. BLUE
2. RED
3. DARKBLUE
4. LIGHT BLUE
5. BLUE
6. DARK RED
7. LIGHT RED
8. RED
9. WAIT
10. YOU ARE CORRECT
11. TRYAGAIN

FOR DIMENSIONS REFER TO PAGE NO 16A, 16 B,.

Colours in Nature

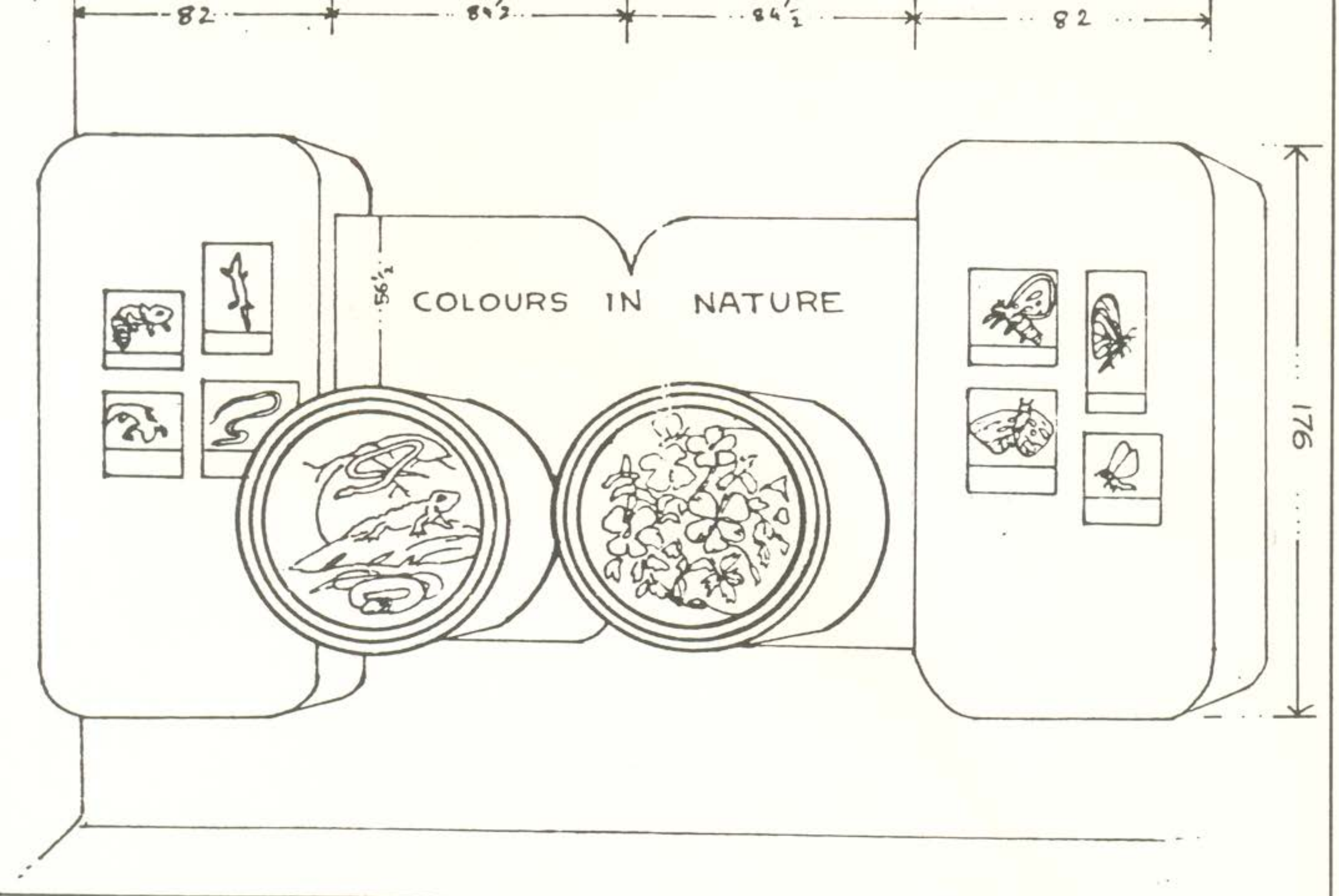
A. FISH TANK
B. BACK BOARD
C. CYLINDERS WITH REPTILES & BUTTERFLIES
D1. D2. BOARDS WITH TRANS LIGHTS
E. MIDDLE DIORAMA WITH DISPLAY OF STUFFED BIRDS
F1. F2. BOARDS WITH TRANS LIGHTS
G. BACK BOARD
H. CYLINDERS WITH INSECTS & BIRDS WITH EGGS.
I. BIRD CAGE.
J. GLASS BOX CONTAINING MAN MADE COLOURS
K. BOX CONTAINING NATURAL STONES & SAND

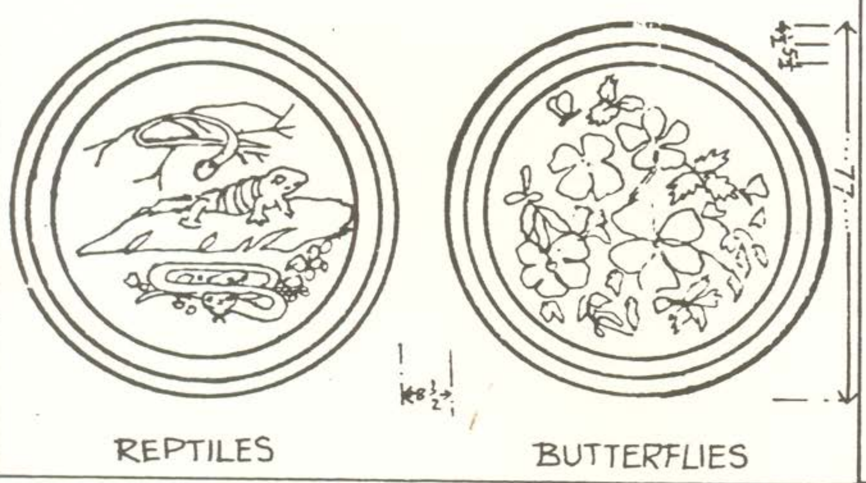
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
16	COLOUR	COLOURS IN NATURE

ALL DIMENSIONS IN C.M.



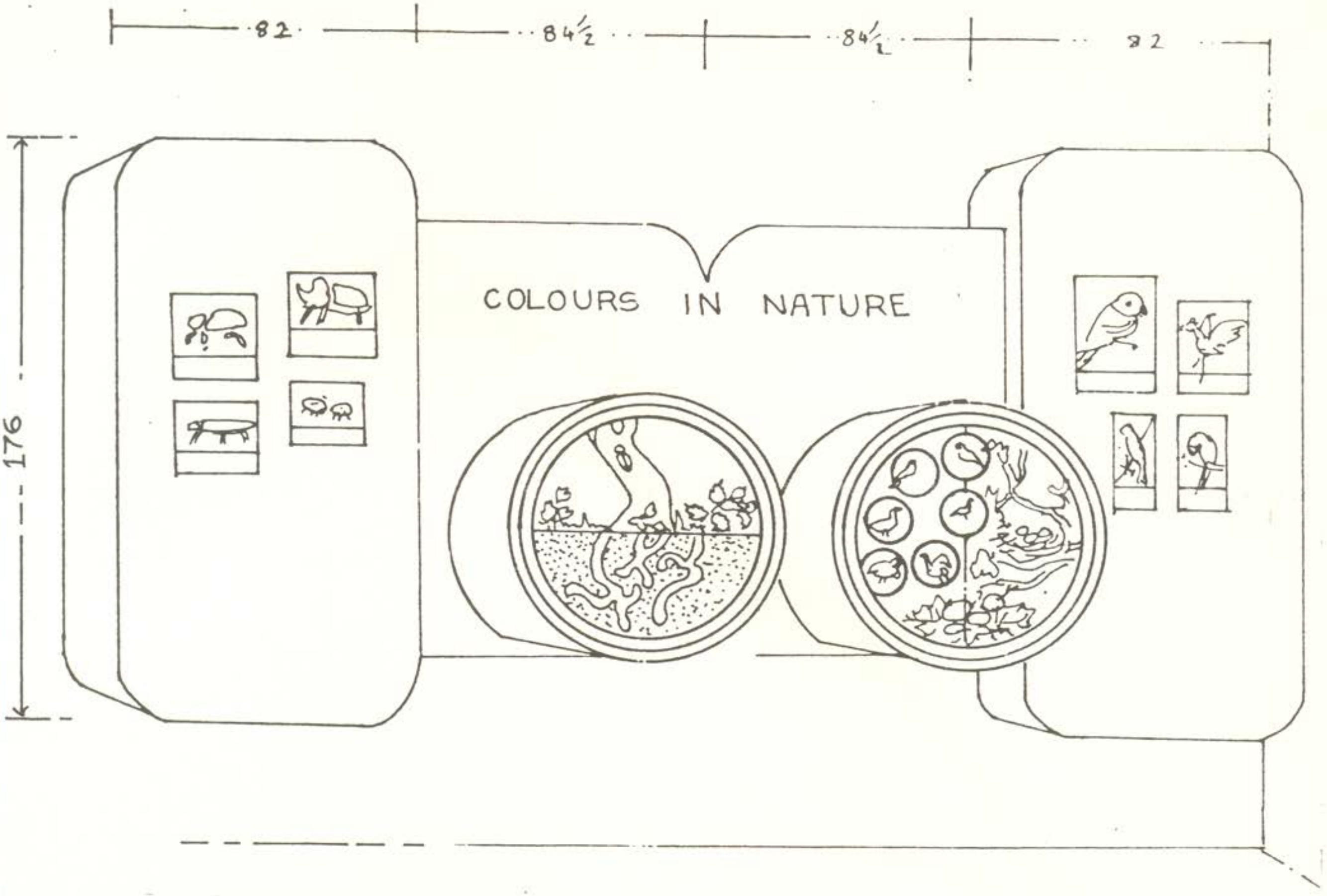


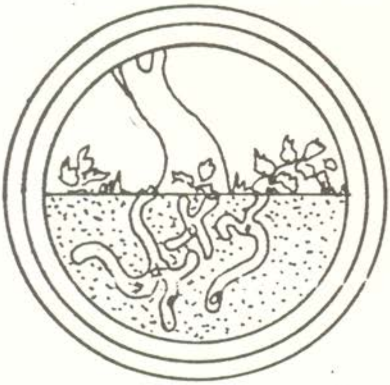
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

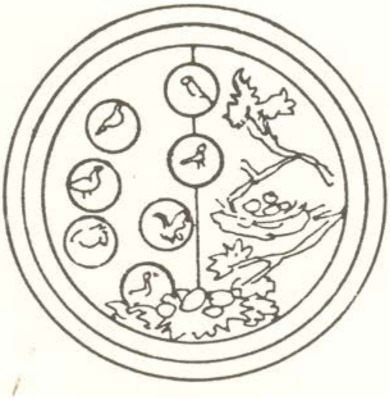
SL.NO	SECTION	TITLE
16A	COLOURS	COLOURS IN NATURE

ALL DIMENSIONS IN C.M.





INSECTS



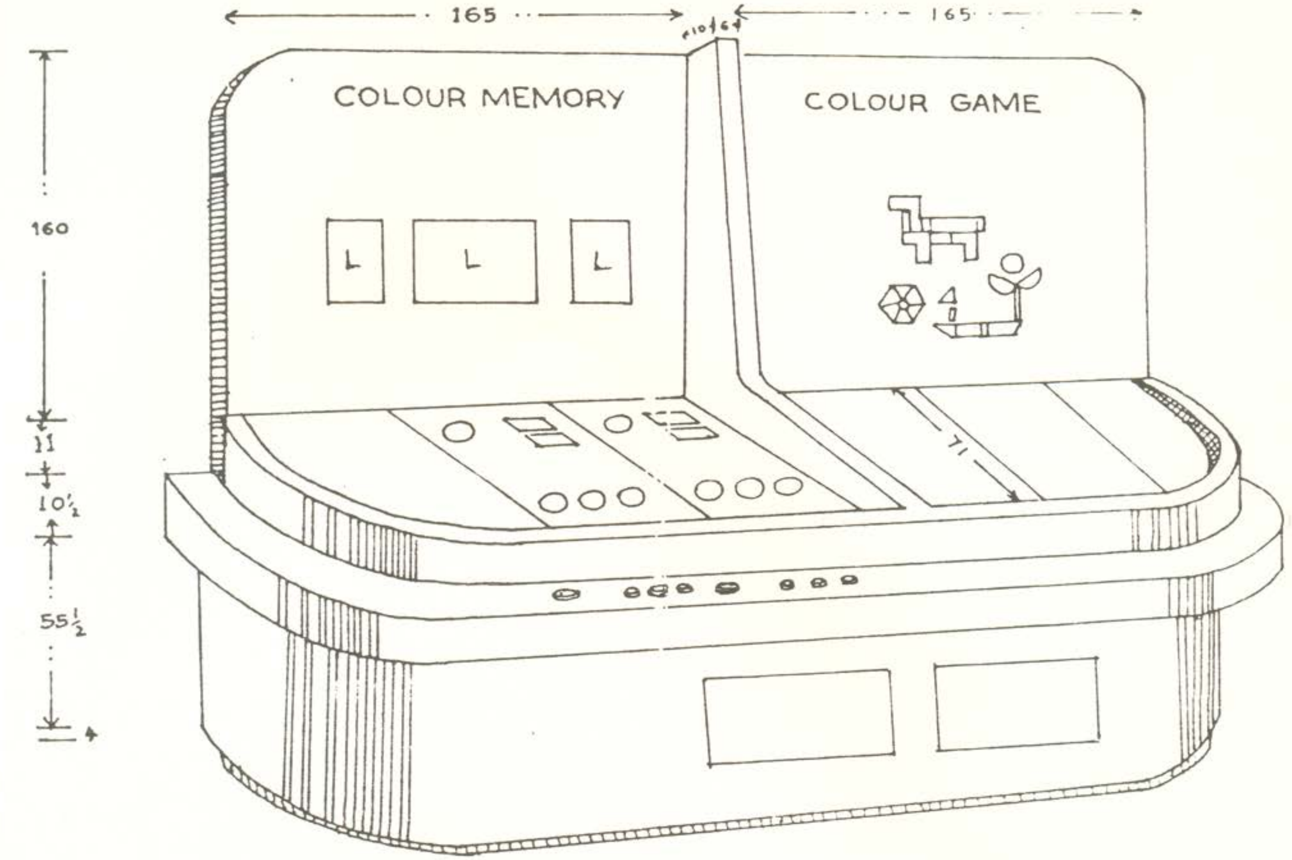
BIRDS

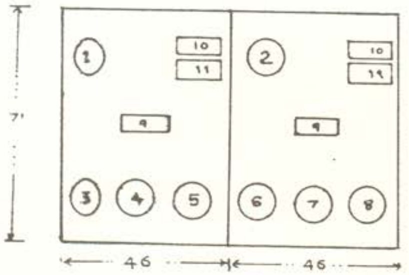
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

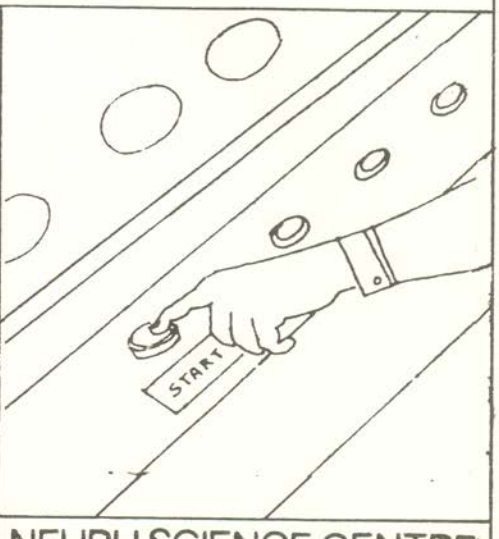
SL.NO	SECTION	TITLE
16 B	COLOURS	COLOURS IN NATURE

ALL DIMENSIONS IN C.M.





1· BLUE
2· RED
3· DARK BLUE
4· LIGHT BLUE
5· BLUE
6· DARK RED
7· LIGHT RED
8· RED
9· WAIT
10· YOU ARE CORRECT
11· TRY AGAIN



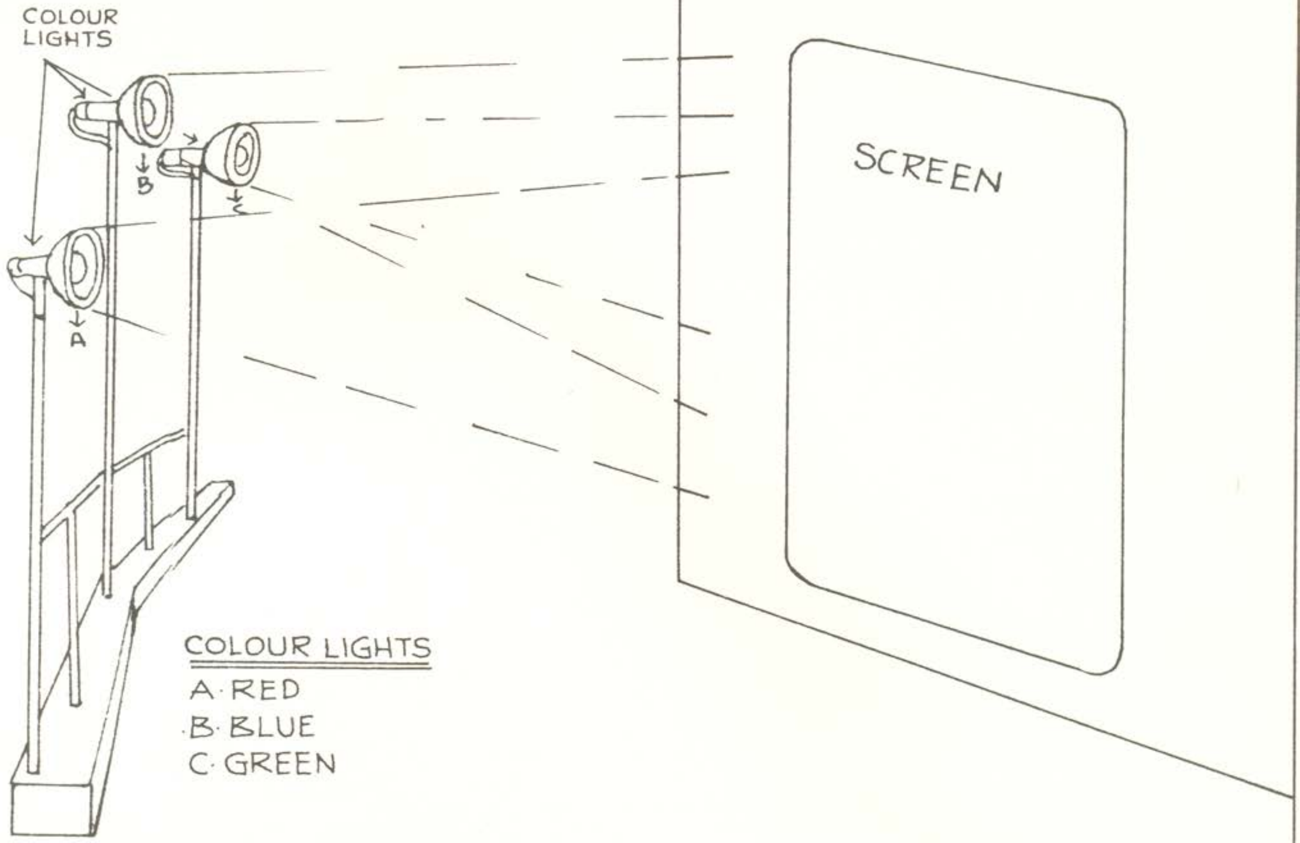
Push the yellow switch. A question colour appears on the screen, which you have to observe very carefully. After the colour disappears, wait for some time. Next you will see three colours on the screen, can you guess which one of these three has the same shade as the 'question colour' that you have seen earlier? Push the green switch below your answer and observe the result on the screen.

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
17	COLOUR	COLOUR MEMORY

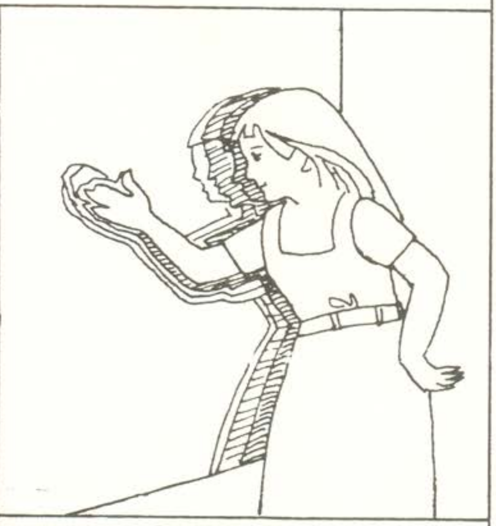
ALL DIMENSIONS IN C.M.



Three primary colour lights - red, green and blue - are directed at a wall. Stand in front of the screen and watch your shadows in colours. The shadows are magenta, cyan and yellow.

The magenta shadow is formed due to absence of green colour from the combination of red, green and blue. The cyan is formed due to the absence of red from the combination of three.

Similarly, the yellow shadow is formed due to the absence of blue colour from the combination. Try to overlap the shadows to make them more colourful and interesting.

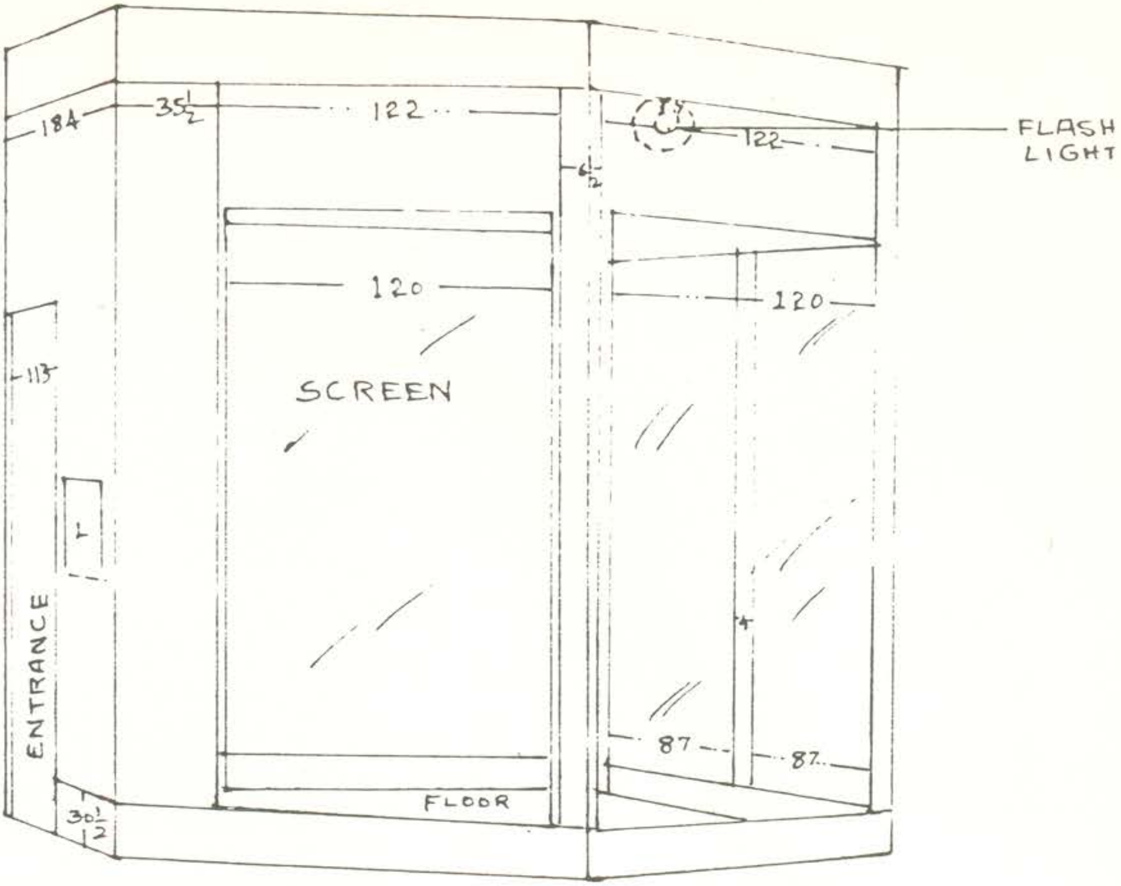


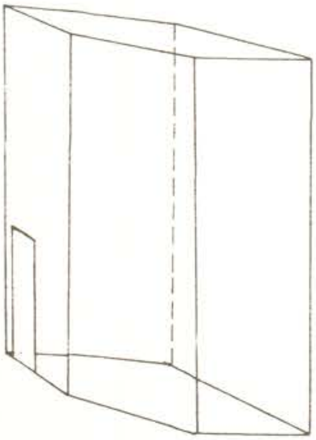
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
18	COLOUR	SHADOW SCREEN

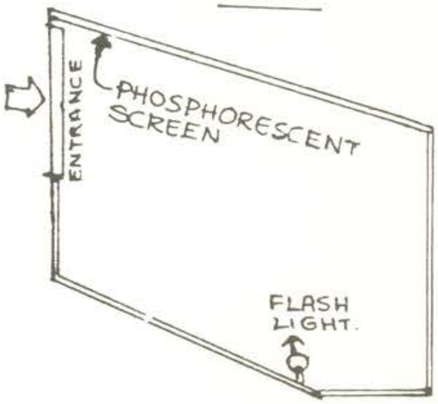
ALL DIMENSIONS IN C.M.





ELEVATION

PLAN



Enter the shadow-room and pose in front of the large white screen. Keep yourself steady till the light flashes on you. Now move away and observe your shadow on the screen.

[p.t.o.

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

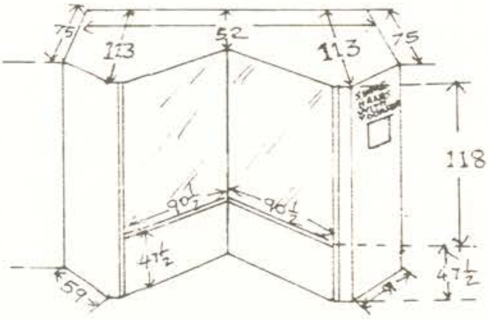
SL.NO	SECTION	TITLE
19	COLOUR	SHADOW ROOM

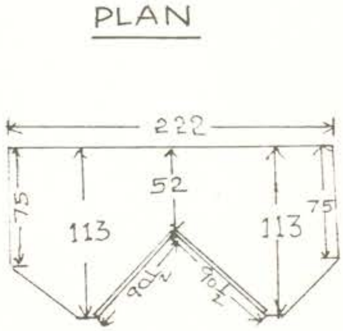
ALL DIMENSIONS IN C.M.

The screen is made of phosphorescent material. This material absorbs light falling on it, and then releases it after the falling light goes off.

Light does not fall on the screen area covered by your body and your shadow is seen there. As soon as the flash of light goes off, the screen is seen glowing for some time, except the area of the screen covered by your body.

You observe a dark area showing the outline of your body.





Stand in the circle marked on the floor near the two mirrors which are placed at right angles to each other. Three images are formed on the mirrors. Extend your right hand and try to shake hands with all the three images one by one. You will notice that it is possible to shake hands only with the centre image. In case of the other two images, when you extend your right hand the image appears to extend its left hand.

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

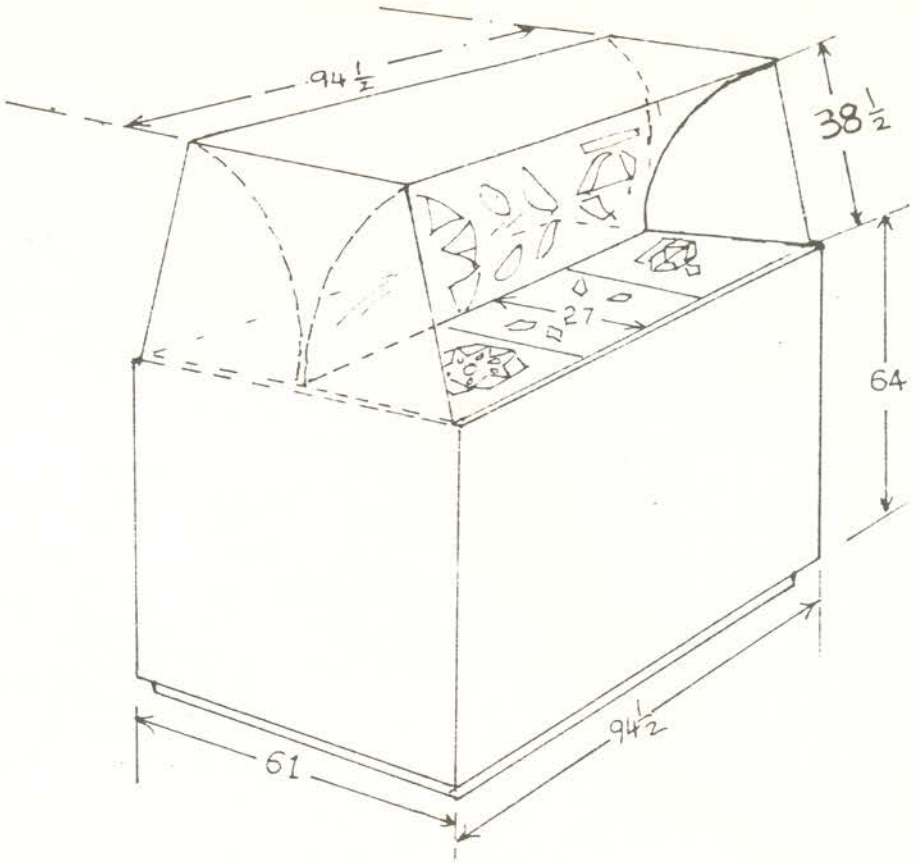
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
20	IMAGE	SHAKE HANDS WITH YOURSELF

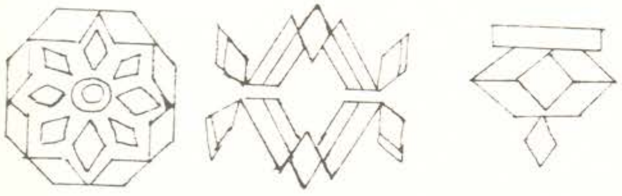
ALL DIMENSIONS IN C.M.

[p.t.o.

Such images are called as laterally inverted (side inverted) images. Only the centre image is the exact replica.



DESIGN CUTOUTS ON COLOUR SHEETS ON THE GLASS



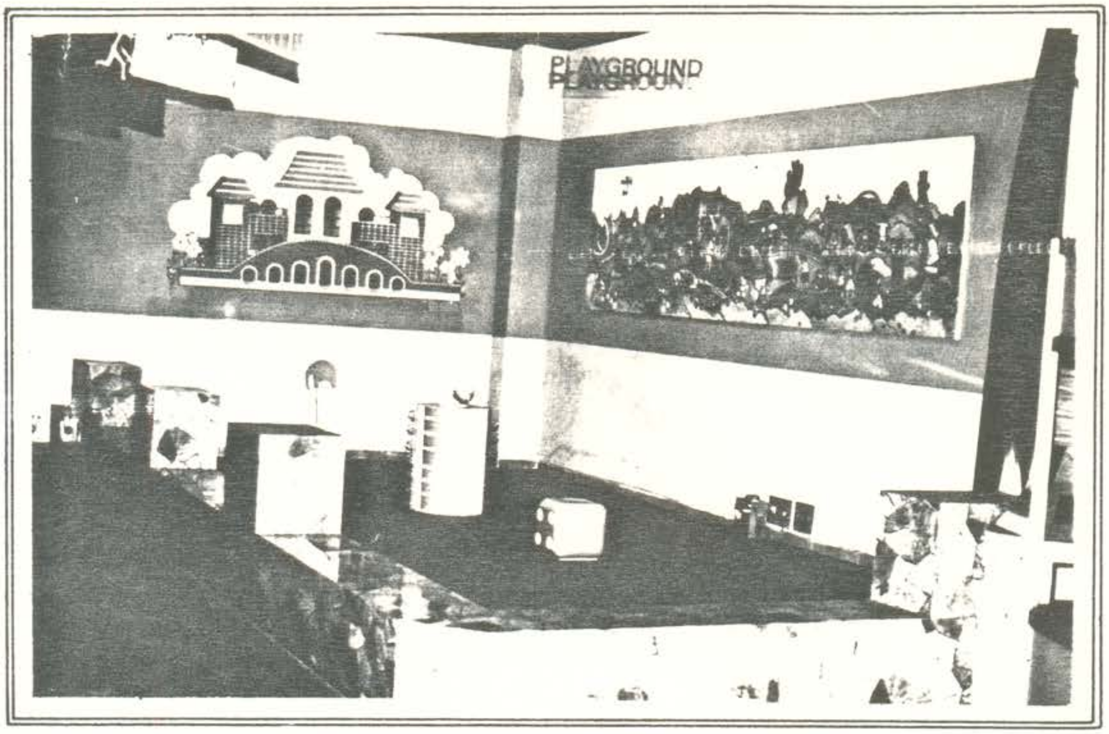
There are three cut out patterns of coloured plastics placed on each side of the exhibit. View these patterns in the curved mirror and observe their forms. The image of the pattern changes to some other form, as you move away from the mirror. This happens because the mirror is curved.

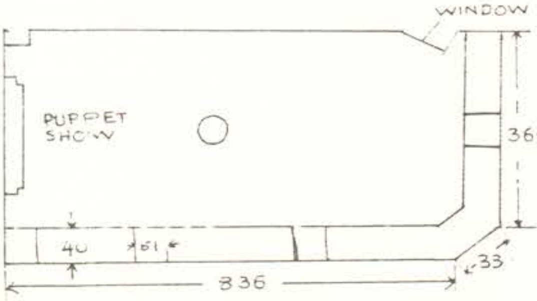
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
21	REFLECTION	

ALL DIMENSIONS IN C.M.





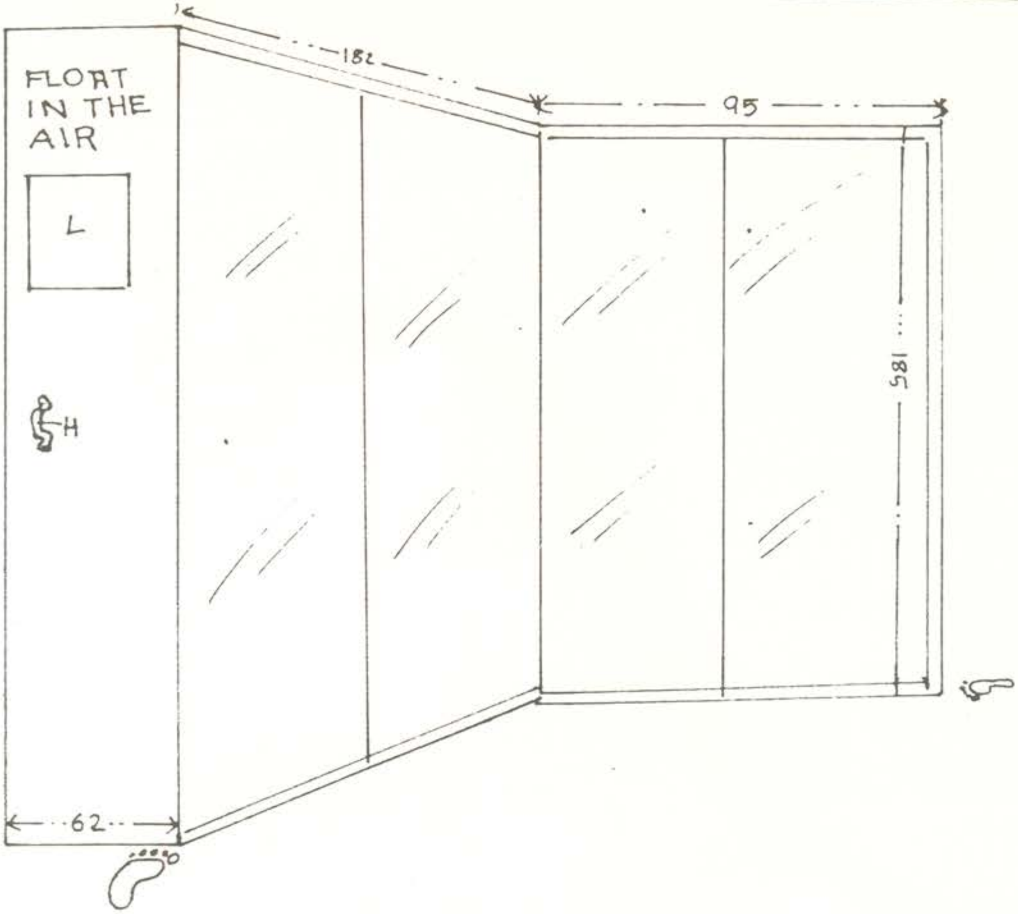
Playground area is meant for the kids of 4-8 years of age. Parents visiting the Centre could avail this facility for their kids. Building block kits, games and playthings are made available for the kids. An explainer takes care to guide the kids in using the kits and games. This would facilitate the kids in developing the skill and initiate a culture of "do it yourself".

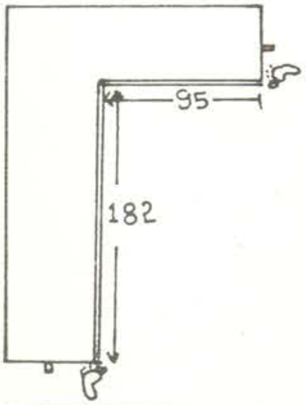
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
22	COLOUR	PLAY GROUND

ALL DIMENSIONS IN C.M.

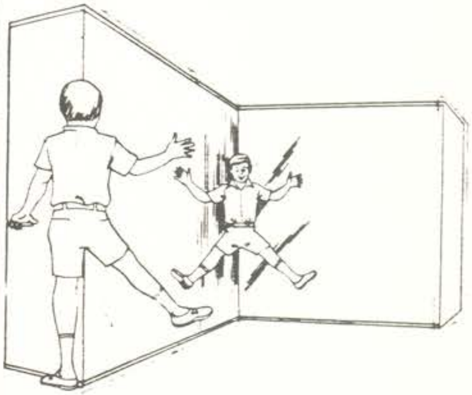




PLAN DRAWING OF FLOATING IN THE AIR EXHIBIT

A· MIRRORS
B· BACK BOXES
H· HANDLE
L· LABEL
F· FOOT STEP

Stand in the circle marked on the floor near the edge of a big mirror. Place your nose and the centre of your body on the edge of the mirror so that the edge divides your body exactly in two halves. Lift your right leg slowly and observe. You appear to be floating in the air as astronauts float in space. Do you really float?

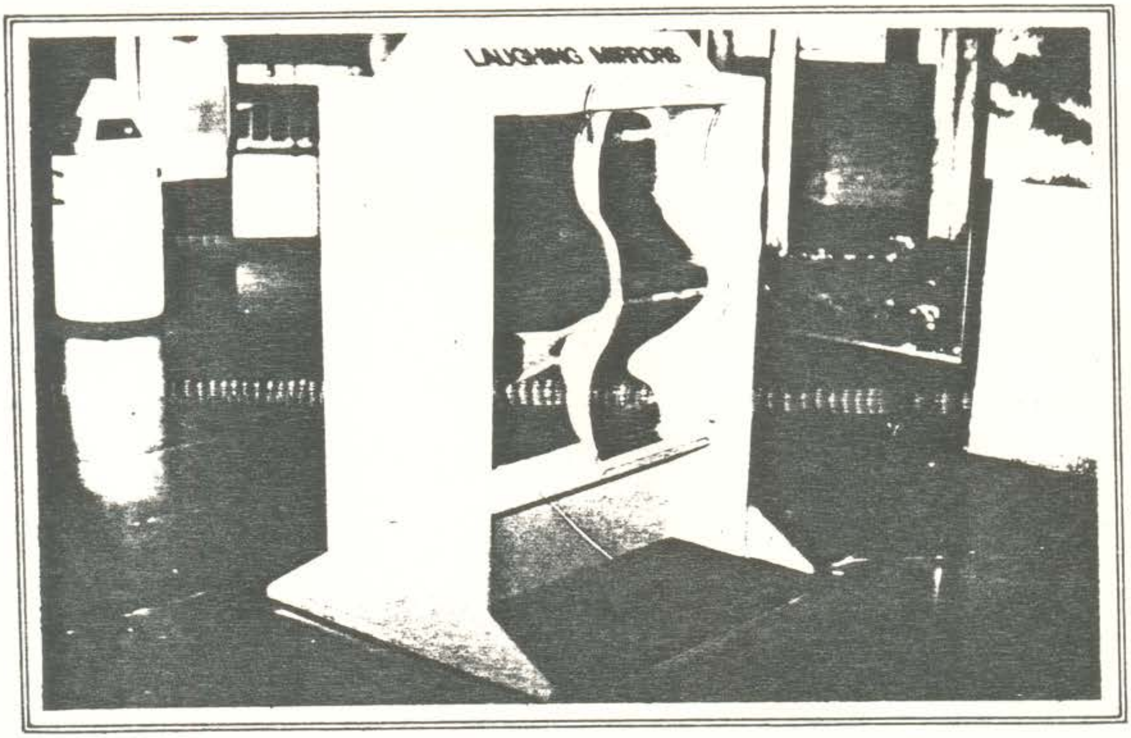


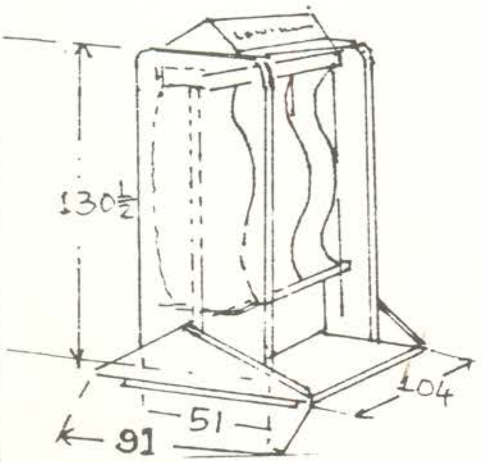
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

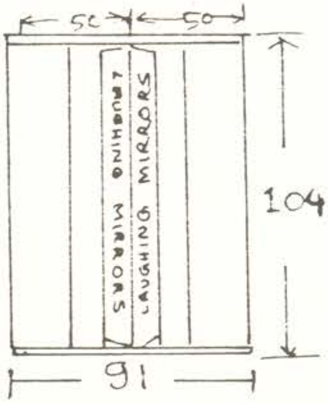
SL.NO	SECTION	TITLE
23	IMAGE	REFLECTION

ALL DIMENSIONS IN C.M.





PLAN

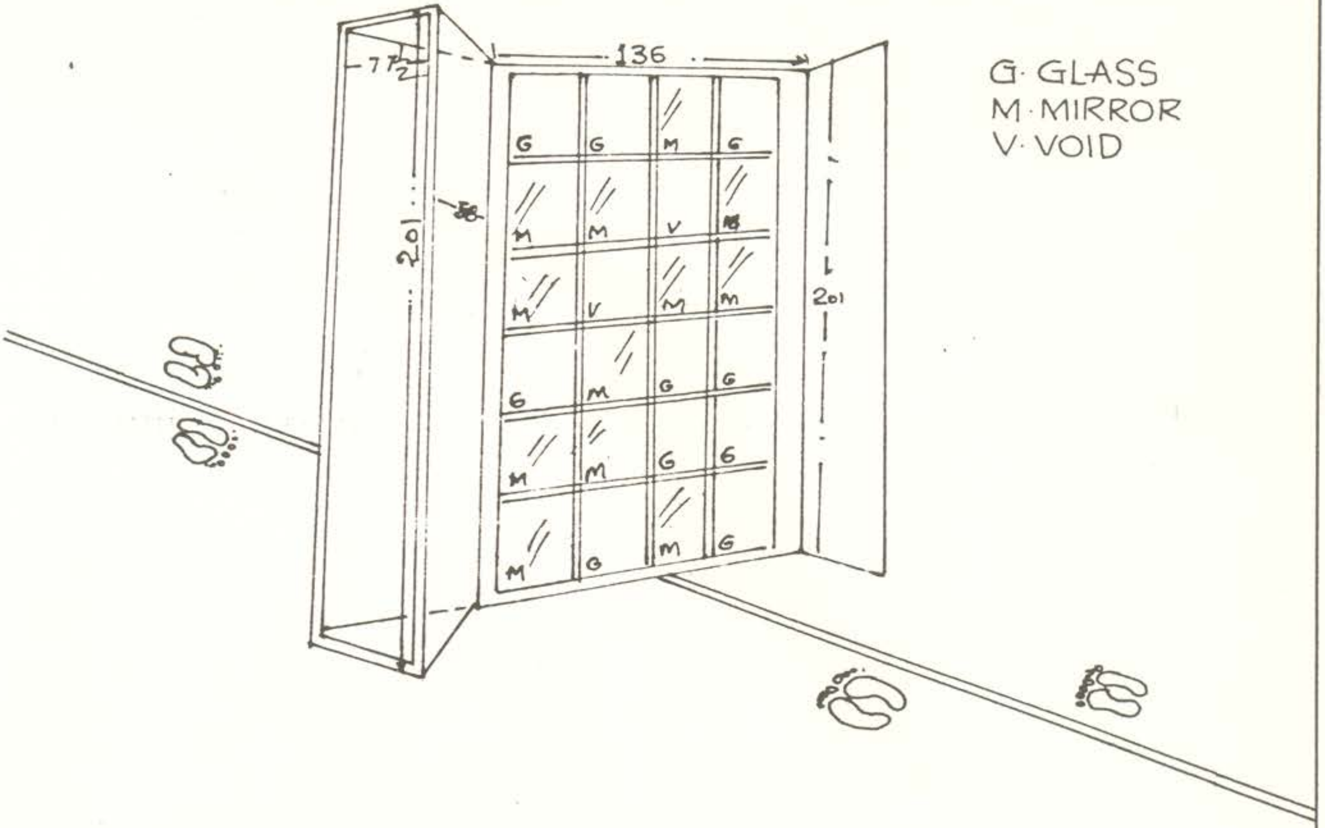


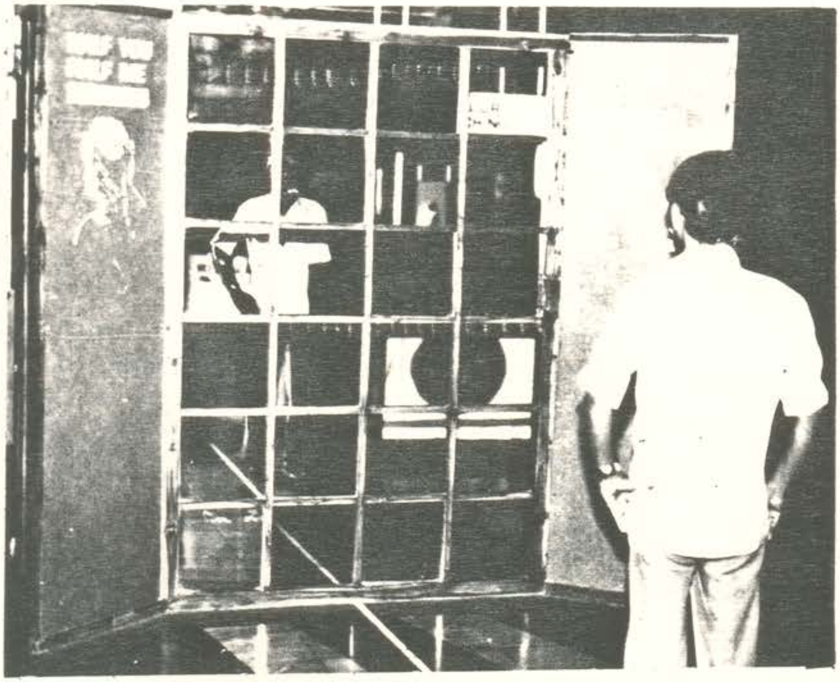
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

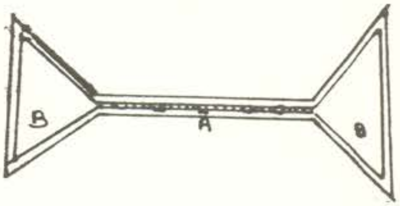
SL.NO	SECTION	TITLE
24	IMAGE	LAUGHING MIRRORS

ALL DIMENSIONS IN C.M.





PLAN



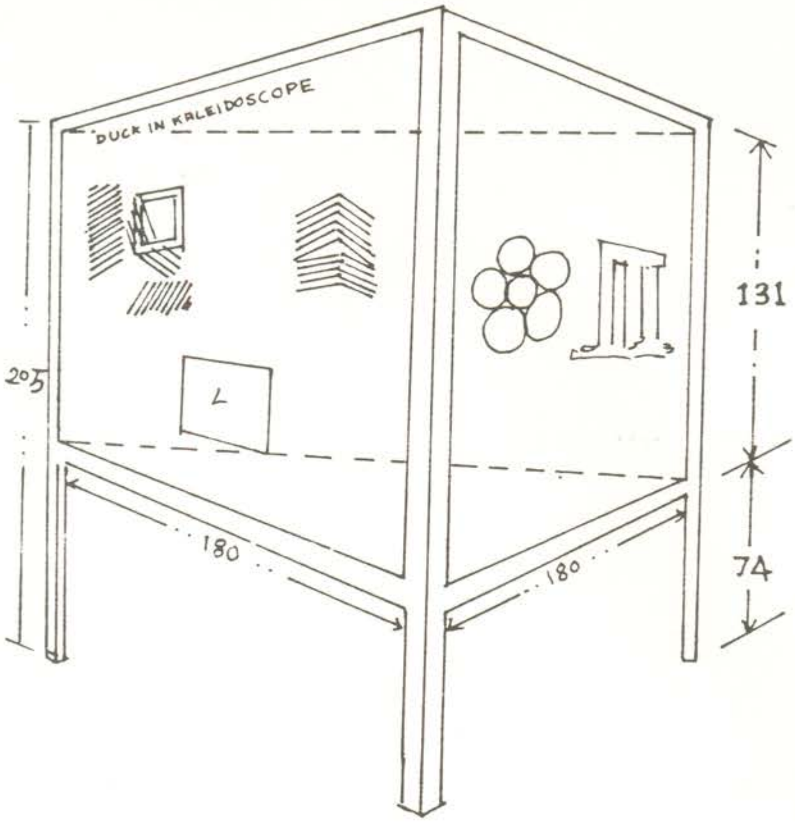
A· FRAME FOR GLASSES

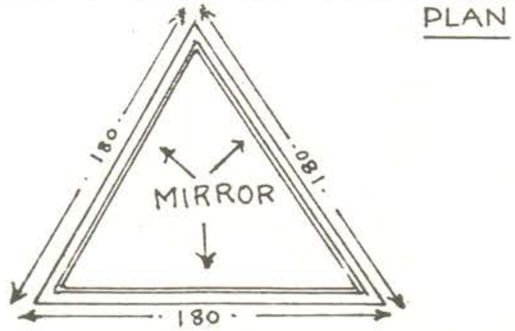
B·B· SIDE SUPPORT FRAMES

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

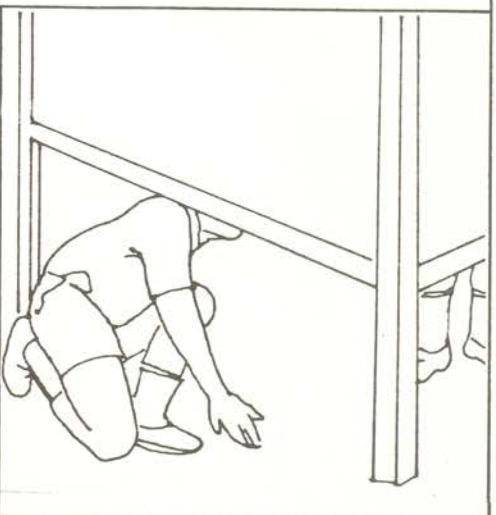
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
25	IMAGE	HALF YOU AND HALF ME





This large three sided enclosure has mirrors on three inner surfaces. Duck inside and see. Can you count the number of images? Do you think that you are looking into infinity? Due to multiple reflections, you see infinite images. Subsequent reflections become weaker and weaker and the images appear further and farther away.

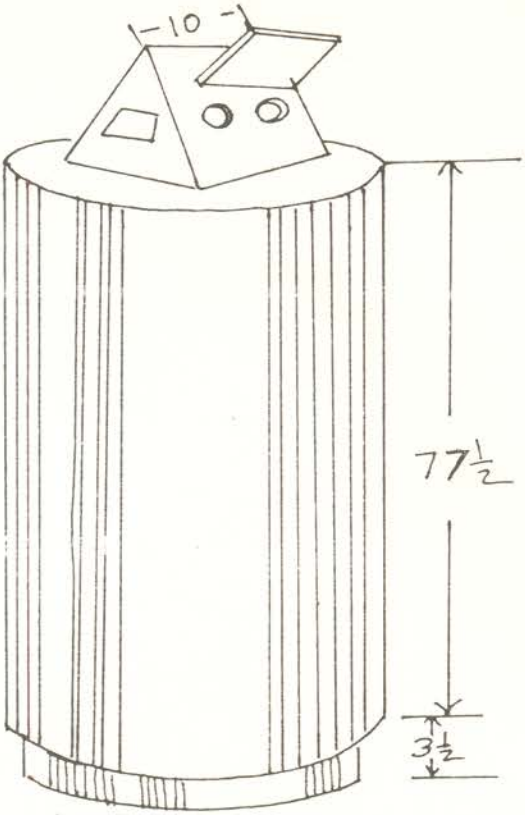


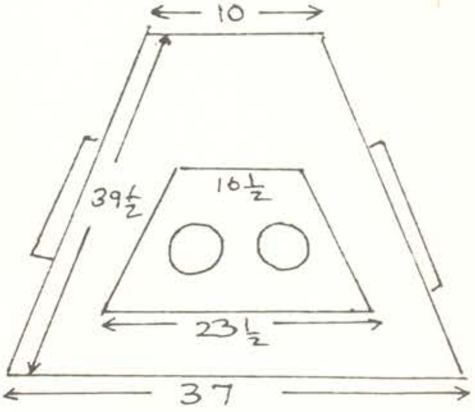
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

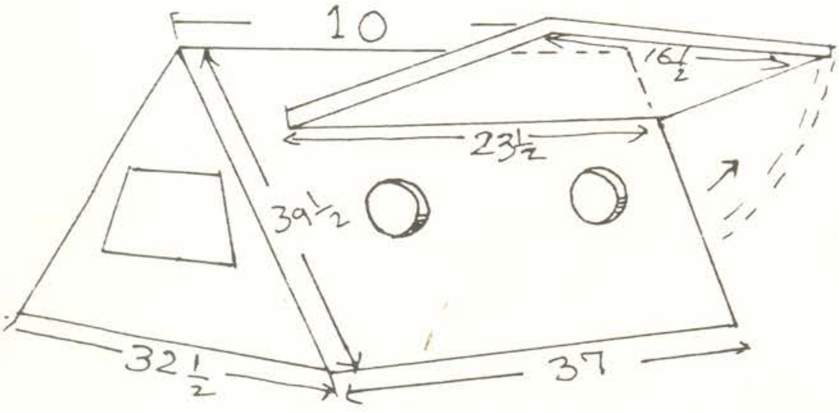
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
26	VISION	DUCK IN KALEIDOSCOPE

ALL DIMENSIONS IN C.M.







Open the flaps on green sides and inhale the objects inside which are seen through the windows. Now open the flaps on red sides and inhale. Try to identify the objects kept inside.

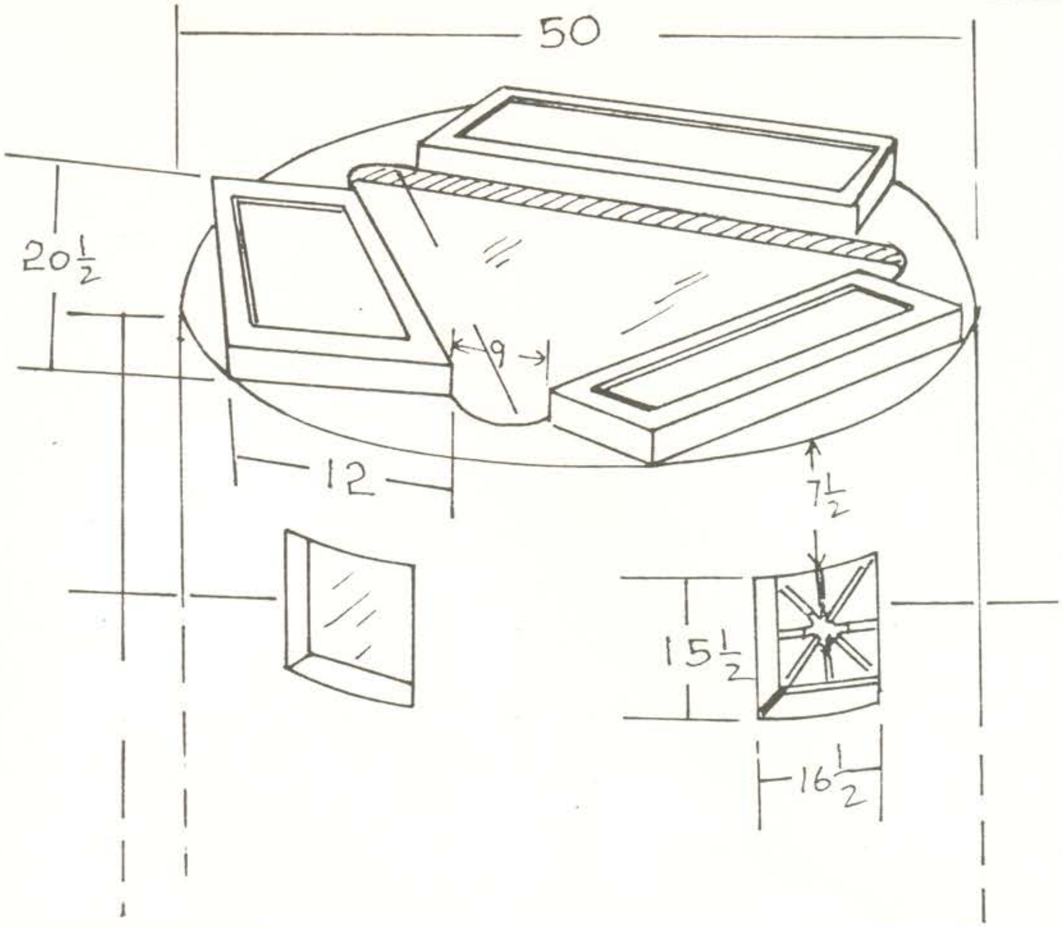
NEHRU SCIENCE CENTRE

BOMBAY. N.C.S.M.

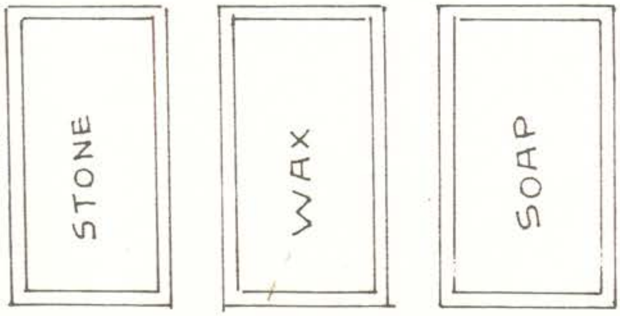
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
27	SMELL	QUIZ

ALL DIMENSIONS IN C.M.



SAMPLES



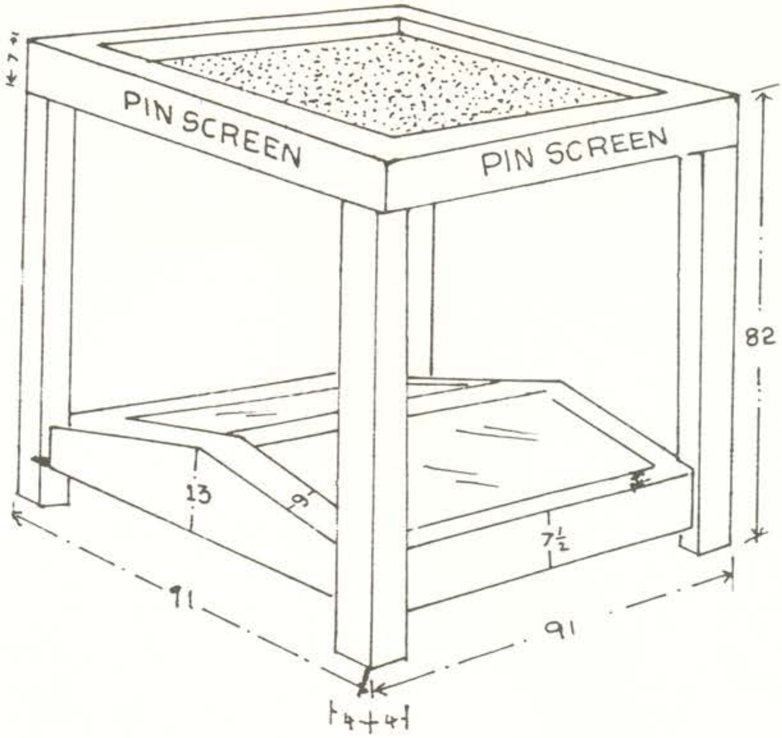
Touch all the three surfaces placed on the top and remember the feelings. Insert your hand through the rubber flaps on the side of the table. Touch the surface placed inside and try to identify it. Can you guess the surface inside? If not, see through the glass window.

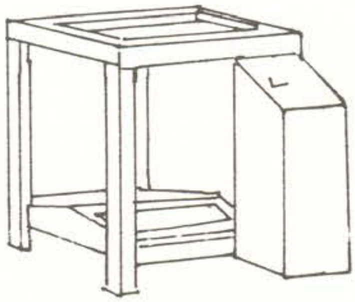
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

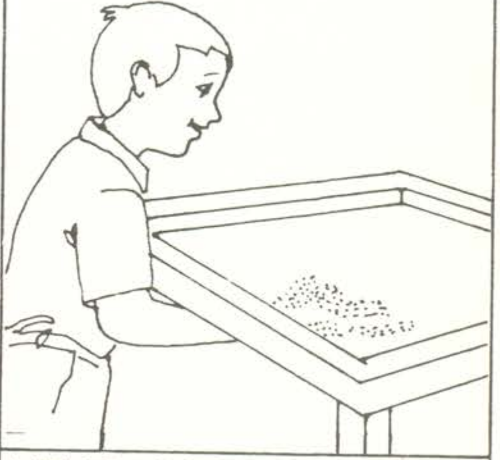
SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
28	TOUCH	QUIZ

ALL DIMENSIONS IN C.M.







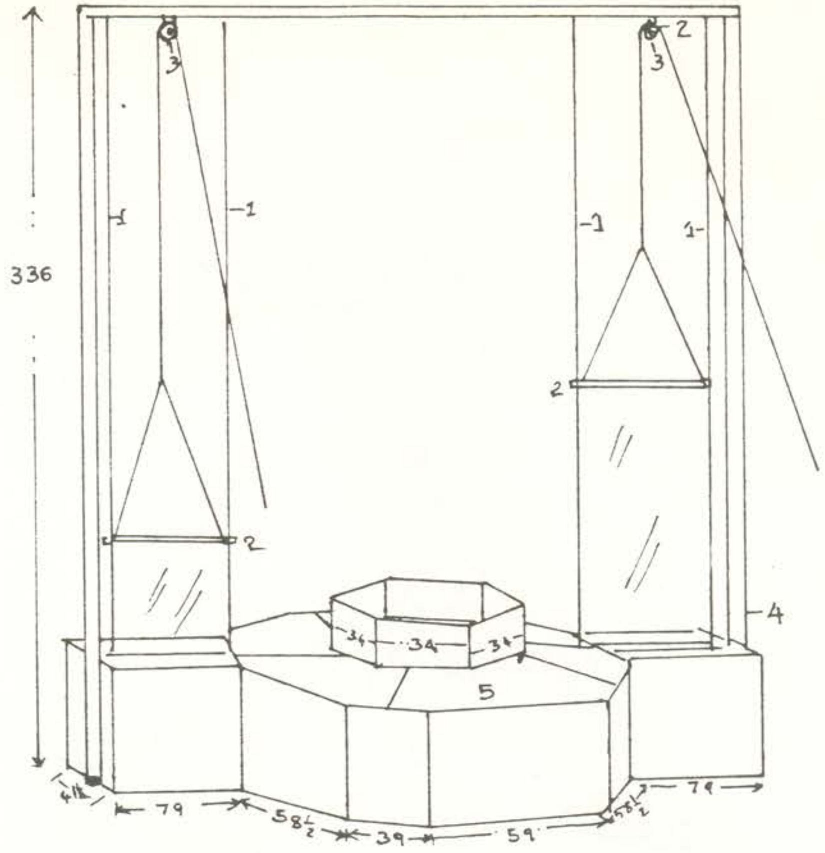
Place your hand gently at the bottom surface of the pinscreen. How do you feel? Can you believe that about 1,53,000 pins are mounted on this screen?
Now move your palm gently below the pins and create interesting patterns on the screen. You get a peculiar sensation on your skin too.

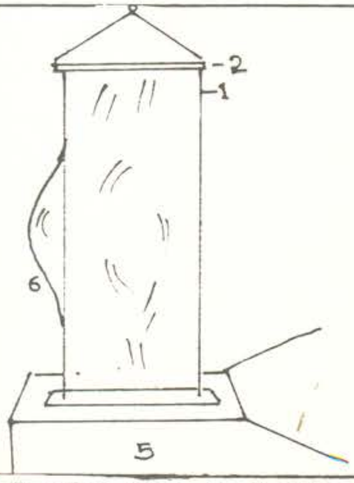
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

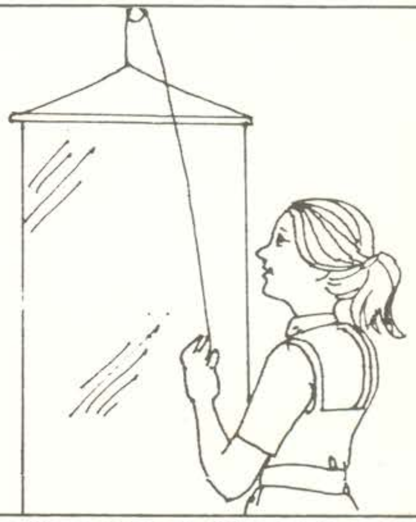
SL.NO	SECTION	TITLE
29	TOUCH	PINSCREEN

ALL DIMENSIONS IN C.M.





1· ROPE
2· MOVING ROD
3· PULLEY
4· BOUNDARY FRAME
5· SOAP TANK
6· FILM



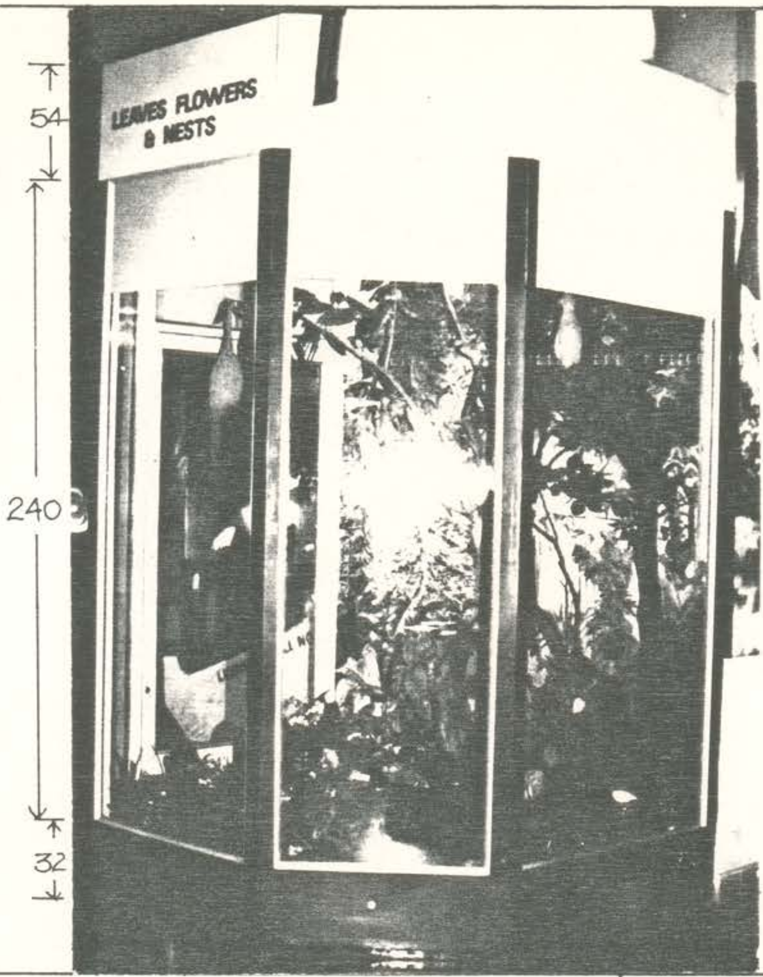
Lift slowly the rod dipped in the soap solution by pulling the string attached to it. As the rod goes up, a thin transparent soap film also extends up with the rod. The bigger the film you make, the more skilled you are. Prove your skill. What happens when you blow gently on the soap film?

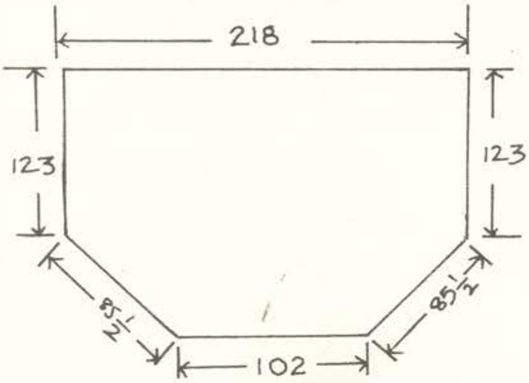
NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
30	SHAPE	SOAP FILM

ALL DIMENSIONS IN C.M.





LEAVES FLOWERS & NESTS

NEHRU SCIENCE CENTRE
BOMBAY. N.C.S.M.

SCIENCE FOR CHILDREN

SL.NO	SECTION	TITLE
31	COLOUR	LEAVES FLOWERS & NESTS

ALL DIMENSIONS IN C.M.